

Estimating the value of content  
and applications services for  
Internet users in Europe

December 2023



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# Disclaimer

## Limits and scope of our intervention

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# Executive Summary

## Background

Over the last decades, the birth and development of the Internet has allowed its multiple users, and society more broadly, to benefit from a large diversity of services that is continuously evolving. The collaboration between several interdependent actors, interacting and benefiting from each other in the process of satisfying consumer needs, has been crucial to the success of the Internet. Central amongst these actors are telecommunications providers and content and application providers (CAPs, also known as Over-The-Top applications, OTTs). A variety of stakeholders, including telecommunications providers, cooperate to build the connectivity infrastructure that allows consumers to reach the services provided over such infrastructure by CAPs.

In April 2022, a study for several telecommunications providers attempted to estimate the costs associated with the network traffic from Internet users accessing the services of OTT players.<sup>1</sup> This was shortly followed by another study for the European Telecommunications Network Operators' Association (ETNO) supporting a financial contribution from "very large OTTs" to telecommunications providers.<sup>2</sup>

Following these studies, in February 2023 the European Commission (EC) launched a consultation on the future of the electronic communications sector and its infrastructure.<sup>3</sup> The stated aim of the consultation was to gather stakeholders' views on the existing situation of the sector and its future. As part of this exercise, the EC also consulted on the potential need for large CAPs to make financial contributions to telecommunications providers.

In contrast to the numerous reports on the potential costs associated with the services provided by CAPs, there has been limited research on the value that Internet users place on the services provided by these businesses. The objective of this study is to shed some light on this question.

## Objective of the study

Consumers use their broadband connection for different purposes: information searches, videoconferences, streaming video, social media, online gaming, etc. Amongst the services accessed by consumers through their mobile or fixed broadband connection, some of the services provided by CAPs require more bandwidth than others, e.g. video streaming and sharing, social networks and online gaming.<sup>4</sup> The objective of our study is to assess the share of the value of their broadband subscription that consumers attribute to accessing these three categories of contents and services.

Given the scarcity of economics research addressing this question, and to put consumers back at the center of its answer, Amazon has commissioned a study from Deloitte Finance that relies on a consumer survey of fixed and broadband subscribers in several countries of the European Union.

## Methodology

The starting point of the study are the representative consumer surveys performed in four countries: France, Germany, Italy, and Spain. These surveys were conducted in 2023 by the French polling and market research firm IFOP.

We analyze the results of the surveys through a choice-based conjoint analysis methodology in order to estimate

consumers' willingness to pay for accessing certain services offered by CAPs through their fixed and mobile broadband connections.

Based on the consumer survey results, we first estimate the value attributed by Internet users to accessing the services provided by large CAPs in each of the countries surveyed and for each of their fixed and mobile subscriptions. These results are then extrapolated to estimate the total value attributed by Internet users in the European Union and the United Kingdom (hereinafter "Europe"). Finally, after estimating the value that Internet users attribute to accessing video streaming and sharing, social networks and online gaming through their broadband subscription, we compare this value to the network costs that telcos claim can be attributed to these services, as estimated by Frontier Economics (FE) for ETNO.<sup>5</sup> In our study, we do not audit the cost estimates from FE nor attempt to refute their conclusions. ISPs' claims and FE's report are used as a reference point without analyzing or endorsing them.

Our study also provides a more detailed assessment of the value consumers attribute to a subset of CAPs with global presence, referred to as Global CAPs. For this, the study uses evidence from the 2023 Sandvine report to identify the share of traffic in the data-intensive categories of services (video streaming and sharing, social networks and online gaming) that can be attributed to the eight CAPs Netflix, Microsoft, Alphabet, Meta, Amazon, Apple, Disney+ and ByteDance.<sup>6</sup>

<sup>1</sup> Frontier Economics, "Estimating OTT traffic-related costs on European telecommunications networks", 7 April 2022 (Link to the report: [Etude - Mai 2022.pdf \(orange.com\)](#)).

<sup>2</sup> Axon Partners Group, "Europe's internet ecosystem: socio-economic benefits of a fairer balance between tech giants and telecom operators", May 2022 (Link to the report: [Study on the implications of an unbalanced IP traffic market on European socio-economic welfare \(etno.eu\)](#)).

<sup>3</sup> Link to the consultation: [The future of the electronic communications sector and its infrastructure | Shaping Europe's digital future \(europa.eu\)](#).

<sup>4</sup> In an open letter signed by the Chief Executives of Telefónica, Deutsche Telekom, Vodafone and Orange, the authors argued that video streaming, gaming and social media represent the majority of traffic running over telecommunications providers' networks. Financial Times, February 2022. Signed by José María Álvarez-Pallete López, Chairman and Chief Executive, Telefonica; Tim Höttges, Chief Executive, Deutsche Telekom; Nick Read, Chief Executive, Vodafone; Stéphane Richard, Chairman and Chief Executive, Orange. Available at the following link: <https://www.ft.com/content/68f989f5-96e6-440e-90f4-2a11840d9c99>.

<sup>5</sup> Frontier Economics, "Estimating OTT traffic-related costs on European telecommunications networks", 7 April 2022 (Link to the report: [Etude - Mai 2022.pdf \(orange.com\)](#)).

<sup>6</sup> Sandvine, The Global internet phenomena report, January 2023.

**Main findings**

Our study shows that consumers place a high value on being able to use and access data-intensive services with their broadband subscription.

We estimate that the annual value attributed by European Internet users to accessing services provided by large CAPs ranges between €32bn-€53bn for fixed broadband and between €55bn-€91bn for mobile broadband depending on the assumptions taken. When compared to the high-end estimate of the annual incremental costs attributed by FE to OTTs' traffic, these figures suggest that the value attributed by European Internet users to accessing services provided by large CAPs is at least five times the incremental costs

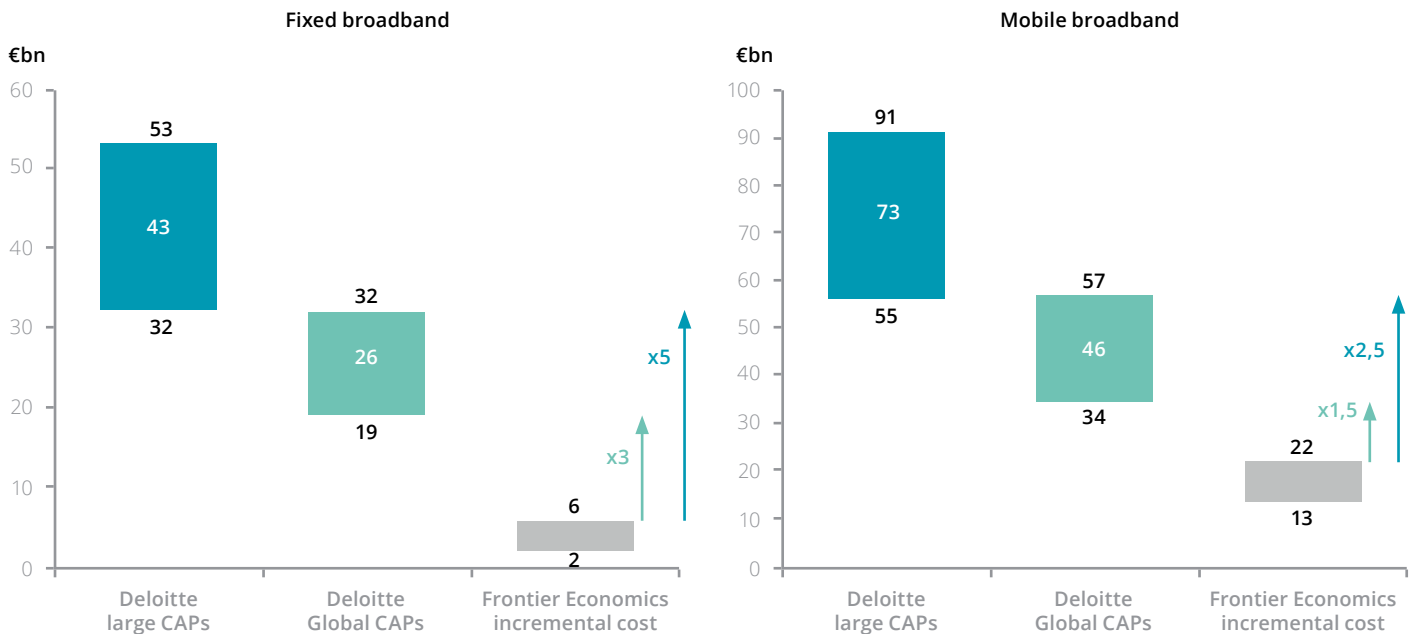
of OTTs fixed traffic (estimated by FE at between €2-6bn) and more than twice that of mobile traffic (€13-22bn), as shown in Figure 1 below.

When comparing the value attributed to the services offered by the subset of Global CAPs, we also find this to be well in excess of the costs estimated by FE for all OTTs. In particular, the value European Internet users attribute to accessing Global CAPs' services ranges between €19-32bn for fixed broadband and €34-57bn for mobile broadband. Even the values estimated for Global CAPs (a subset of all OTTs) are well above the highest-end costs attributed by FE to all OTTs traffic, as shown in Figure 1 below.

In conclusion, our study finds that the value created by CAPs for telecom customers is well in excess of any cost that telecommunications providers have claimed may be attributed to CAPs.

Figure 1

**Total value attributed by Internet users to accessing services provided by large CAPs across Europe vs. incremental costs attributable to OTT traffic (in € bn, per year)**



Source: Deloitte Finance



# Introduction

Fixed and mobile broadband subscriptions allow consumers to access different types of services: they can watch videos or stream TV, use social networks, play games online, perform online searches, shop online, etc. The economic literature includes several studies quantifying consumers' willingness to pay for broadband access or for some of its characteristics (e.g., bandwidth, latency, price, data caps, etc.). Conversely, there is more limited research on the value that Internet users attribute to the services they can reach with their broadband subscription.

Content and Applications Providers<sup>7</sup> (CAPs), also known as Over-The-Top applications (OTTs), are at the heart of Internet users' habits. They provide the services and content that consumers want to access with their broadband subscription. Amongst the CAPs, a subset provides data-intensive services such as video streaming and sharing, social networks and online gaming. In this report we refer to this subset of CAPs as large CAPs. Their popularity among end users makes them stand out in terms of size and volume of data that they provide to broadband users.

In recent years, there has been a push by telecommunications operators to argue that network data provided at the request of end users is somehow generated by CAPs and that CAPs should pay for the costs associated with this traffic. Telecommunications operators have supported this view with several studies attempting to estimate the network costs associated with the traffic of over-the-top (OTT) players and supporting a financial contribution from "very large OTTs" to telecommunications providers.

<sup>7</sup> The UK regulator (OFCOM) defines a content and application provider the following way: "A CAP produces content and applications, which it distributes to consumers using the internet. These include video on demand (VOD), social media, gaming, messaging, search, ecommerce and payments, news and government services. CAPs serve a very wide range of segments and can operate different business models" (source: OFCOM, Net neutrality review, consultation, October 2022).

In contrast to the numerous reports on the potential costs associated with the services provided by CAPs, there has been limited research on the value that Internet users place on the services provided by these businesses. In this context, Amazon Europe Core SARL (Amazon) has entrusted Deloitte Finance with the task of estimating the share of the broadband subscription price that Internet users attribute to accessing services of large CAPs and to compare this value with the network costs that telcos associate with their traffic.

To estimate the share of the broadband price that can be attributed to accessing large CAPs, we consider that Internet services can be classified into five categories: video streaming and sharing, social media, live TV and sport, online gaming and basic services. We conducted consumer surveys among representative samples of national populations in France, Germany, Italy and Spain with the French polling and market research firm Institut Français d'Opinion Publique (IFOP)<sup>8</sup> to assess the proportion of the broadband subscription price that end users attribute to accessing each category of services. We then estimate the value that consumers associate with accessing data-intensive categories of services, namely: video streaming and sharing, social networks and online gaming. For this, we use the proportional value that consumers attribute to these services in our surveys and the average price paid by consumers for a broadband subscription in each country. We also compute this value for accessing the same categories of services provided by a subset of Global CAPs.

We then extrapolate the results obtained in the four countries of the survey to estimate the total values attributed by European

consumers to accessing the services provided by large CAPs and by the subset of Global CAPs. We compare these values to the costs that Frontier Economics (FE) has estimated should be associated with OTT<sup>9</sup> traffic on fixed and mobile networks across Europe.<sup>10</sup>

It should be noted at the outset that in an October 2022 report, the Body of European Regulators for Electronic Communications (BEREC) refuted “the argument that traffic is ‘caused’ by CAPs”, explaining that “the ISPs’ customers are requesting a service from the CAP and therefore causing the data traffic involved (...)”. Furthermore, BEREC argued that fixed access network costs exhibit a very low traffic-sensitivity, while mobile networks experience only some degree of traffic-sensitivity. BEREC’s report explains that: “Against this background one of the assumptions underlying the major ISPs’ proposals for CAPs to contribute to networks costs is – in simplified terms – that an increase in traffic directly translates into higher costs. BEREC considers that the debate about network investments, traffic volumes and cost drivers needs to be carefully analysed. Above all, a distinction must be made as to which network segments are being discussed in detail and how the costs are distributed accordingly because, in general, the costs of IP network infrastructures are not very traffic-sensitive. Existing capacity can be utilised up to a certain point without additional costs, and only when higher peak capacity is required, investments in network expansion are necessary. The costs of IP network upgrades that are necessary to handle an increased IP traffic volume are very low compared to the total network costs and upgrades come with a significant increase of capacity”. BEREC then indicates that “Fixed access networks

are to the largest extent not traffic-sensitive and their costs are recovered from customer subscriptions over time” and that “Mobile networks exhibit some degree of traffic-sensitivity. BEREC acknowledges that the cost related e.g. to build additional base stations to increase the capacity in certain areas is traffic-sensitive. However, BEREC considers that the cost of building new network coverage is not traffic-sensitive. Nevertheless, the marginal costs of additional data usage are quite low, as also demonstrated by Ericsson”.<sup>11</sup>

In light of the above, it should be emphasized that the results of the FE study are used as a point of comparison since the study is prominently referenced in the debate, having been reused by Internet Service Providers (ISPs) in particular. This does not mean that we endorse the results of this study. In any event, we think that the most appropriate benchmark in the FE report against which to assess the value attributed by Internet users to services provided by large CAPs should be the incremental network costs.

The present report is organized as follows. The first section presents a background economic literature review related to our study. The second section explains the methodology developed to assess the share of the broadband subscription price that Internet users attribute to accessing each category of service. The third section discusses the approach used to derive the values attributed by Internet users to accessing services provided by large CAPs and by the subset of Global CAPs through their broadband subscription in France, Germany, Spain, and Italy. Finally, the last section generalizes the results to European Internet users and compares them to the network costs estimated in the FE study.

<sup>8</sup> Institut français d'opinion publique. Translated from French: “Among the Top 5 institutes in France, IFOP Group has been the leader in opinion polling since 1938 and a key player in quantitative and qualitative marketing studies in Europe, the USA and China” (source: [Qui sommes-nous ? - IFOP](#)).

<sup>9</sup> Over-the-top.

<sup>10</sup> Frontier Economics, Estimating OTT traffic-related costs on European telecommunications networks, April 7, 2022.

<sup>11</sup> <https://www.berec.europa.eu/en/document-categories/berec/opinions/berec-preliminary-assessment-of-the-underlying-assumptions-of-payments-from-large-caps-to-isps>.

# 1. Review of the literature on the value of Internet services



We provide in this section a review of the literature on the value attributed by consumers to Internet services. Most studies focus on assessing consumers' willingness to pay for Internet access in general and/or for specific characteristics of the broadband connection, using survey data. In addition, a small number of studies examine directly the value attributed by consumers to certain Internet applications such as Facebook. We summarize the existing body of research hereinafter.

A few papers estimate consumers' willingness to pay to improve their Internet access. Savage and Waldman (2005)<sup>12</sup>

use data from a nationwide survey of US residences conducted in 2002 to estimate respondents' willingness to pay for the speed and reliability of their Internet connection. They find that consumers are willing to pay up to \$16.5 per month for a more reliable service and \$11.37 for improved speed. In a more recent survey, Rosston, Savage and Waldman (2010)<sup>13</sup> use data from a nationwide survey conducted in 2009-2010 in the United States to estimate a utility model of household preferences for Internet. The paper concludes that a representative household is willing to pay \$79 per month for a fast and reliable Internet service. In the same

line, Liu (2018)<sup>14</sup> estimates the willingness to pay of US households for key fixed Internet connection features (bandwidth, latency, price and data caps) using data from two nationally administered discrete choice surveys. The paper finds that households are willing to pay more for increased bandwidth but that the incremental value of bandwidth decreases. It also finds that households are willing to pay about \$8.66 per month to reduce latency from levels obtained with satellite Internet connection to levels obtained with wired connections and that consumers place a significant premium on unlimited service.

<sup>12</sup> Savage Scott and Waldman Donald (2005) Broadband Internet access, awareness, and use: Analysis of United States household data. *Telecommunications Policy*, 29, p. 515-633.

<sup>13</sup> Rosston Gregory, Savage Scott and Waldman Donald (2010) Household Demand for Broadband Internet in 2010. *The B.E Journal of Economic Analysis and Policy*, De Gruyter, 10(1), p. 1-45. Available at the following link: <https://ideas.repec.org/a/bpj/bejeap/v10y2010i1n79.html>.

<sup>14</sup> Liu Yu-Hsin, Prince Jeffrey and Wallsten Scott (2018) Distinguishing Bandwidth and Latency in Households' Willingness-to-Pay for Broadband Internet Speed. *Information Economics and Policy*, 45(C), p. 1-15.



Lai, Widmar and Bir (2020)<sup>15</sup> estimate the willingness to pay for broadband in general, relying on a survey of a representative sample of 1,423 individuals in the State of Indiana in 2017. The paper finds that the mean willingness to pay for broadband is between \$0.06 and \$0.10/Mbps<sup>16</sup> per month.

Some literature, albeit rather scarce, investigates consumers' willingness to pay for features of services (e.g., recommendation system, resolution). The results of these papers are not applicable to Europe since they focus on Asian countries, where the development of high-speed Internet and the launch of applications of main CAPs are different than in Europe. Sudtasan and Mitomo (2016)<sup>17</sup> rely on a 2016 survey of 482 respondents in Thailand and estimate the relationship between willingness to pay for fiber and consumption of streamed video and audio content. The study shows that respondents are willing to pay more for fiber access when they spend more time watching movies, suggesting that the existence of streamed video increases the willingness to pay for a connection. Kim et al. (2017)<sup>18</sup> use "conjoint analysis" to estimate households' willingness to pay for OTT services in China and Korea with data from online surveys conducted in 2015. The study estimates the willingness to pay for the key characteristics of OTT services, namely: recommendation system, resolution, viewing options (VOD streaming, live streaming, downloading) and price. The study shows that Chinese consumers are willing to pay a total of 22.6 yuan (USD 3.4) per month for OTT services

that offer personalized recommendation systems, 4 K UHD resolution and a wider range of ways to watch content (such as video on demand, live streaming or downloading and watching content offline). These results suggest that consumers are willing to pay more to benefit from the services offered by OTT services.

A small number of studies estimate the value attributed by consumers to applications. Brynjolfsson et al. (2019)<sup>19</sup> measures consumers' willingness to accept compensation for losing access to various digital services. In the experiment, which was performed on a representative sample of the US population in 2016 and 2017, consumers are asked to make a choice between keeping a digital good or foregoing the good in return for a specific amount of money. The paper finds that the willingness to accept to give up all video was \$1,173 per year in 2017 and the willingness to accept to give up all social media was \$322 per year in 2017. This approach measures willingness to accept, unlike our study which measures willingness to pay. As stated in Brynjolfsson's study and confirmed by other research, the gap between willingness to pay and willingness to accept can be very large so that the results are not comparable to our study. For example, Sunstein (2020)<sup>20</sup> finds "a massive disparity between willingness to pay and willingness to accept" after performing a national US survey including direct questions on the willingness to pay and the willingness to accept of respondents for several social media platforms (including Facebook, Twitter, YouTube, and Instagram).

The paper explains this disparity by the fact that respondents are particularly reluctant to pay for something that they can currently access for free.

Our review of the literature shows that the available studies do not address our question, which is to estimate the value attributed by Internet users to accessing services provided by large CAPs, and more specifically Global CAPs. Indeed, the available literature focuses on the willingness to pay for Internet access in general, for specific characteristics of the connection (e.g., speed) or of certain OTT services (e.g., recommendation system) and finally on the willingness to accept (compensation for losing access to) some social media platforms. Our study aims to fill this gap by measuring this value using survey data.



<sup>15</sup> Lai John, Widmar Nicole and Bir Courtney (2020) Eliciting Consumer Willingness to Pay for Home Internet Service: Closing the Digital Divide in the State of Indiana. *Applied Economic Perspectives and Policy*, 42(2), p. 263-

<sup>16</sup> Mbps: megabits per second.

<sup>17</sup> Sudtasan Tatcha, Mitomo Hitoshi (2016). Effects of OTT services on consumer's willingness to pay for optical fiber broadband connection in Thailand. 27th European Regional ITS Conference, Cambridge (UK), International Telecommunications Society (ITS).

<sup>18</sup> Kim Min Sung, Kim Eun, Hwang ShinYoung, Kim Junghwan and Kim Seongcheol (2017). Willingness to pay for over-the-top services in China and Korea. *Telecommunications Policy*, 41(3), p. 197-207.

<sup>19</sup> Erik Brynjolfsson, Avinash Collis and Felix Eggers (2019). Using massive online choice experiments to measure changes in well-being. *Proc Natl Acad Sci U S A*, 116(15), p. 7250-7255.

<sup>20</sup> Cass Sunstein (2020). Valuing Facebook. *Behavioural Public Policy*, 4(3), p. 370-381.

## 2. Consumer survey design and methodology

Our consumer survey is designed to quantify Internet users' willingness to pay for a fixed or mobile broadband subscription depending on the categories of services it enables to access. The willingness to pay is the maximum price at or below which a consumer will buy a good or service. It reflects how consumers' valuation of their broadband subscription is influenced by the types of services that they can access through a broadband subscription. It is usually different from the price actually paid by the consumer since suppliers are only able to extract a share of consumers' willingness to pay.

The aim of our consumer survey is to obtain the proportion of the total end user's willingness to pay that corresponds to each category of service that can be accessed through a broadband connection. This is then used as an input to estimate the value attributed by Internet users to accessing services provided by large CAPs in the next section.

This section presents the approach followed in the consumer survey design in more detail. It explains the methodology (2.1), the design of the survey (2.2) and describes the data collected (2.3).

### 2.1 Methodology

#### Identifying relevant categories of services that can be accessed through a broadband subscription

Consumer survey data is used to measure Internet users' willingness to pay (in euros, per subscriber) for accessing certain categories of services offered by CAPs through fixed and mobile broadband connections. Our survey identifies five categories of services: (i) "video streaming and sharing", (ii) "social networks", (iii) "online gaming", (iv) "live TV and sport", and (v) "basic services" (an additional category that includes everything else: online shopping, banking services, browsing the web, reading news, streaming music, etc.).

We identify the first three categories of services (video streaming and sharing, social networks and online gaming) as the only relevant to estimate the willingness to pay for the services offered by data-intensive CAPs, which we refer to as large CAPs. However, it should be noted at the outset that this is a conservative approach to estimating the willingness to pay for the services offered more broadly by CAPs or OTTs. The reason is that CAPs also provide data-light services (e.g., e-commerce, music streaming or web search) which are highly valued by consumers yet fall under categories of services in our survey that we exclude from the large CAPs group. The reason we limit our analysis to only the first three more data-intensive categories of services is that these have been the focus of telecoms operators, arguing that they require the greatest bandwidth and generate the largest proportion of network costs.<sup>21</sup>

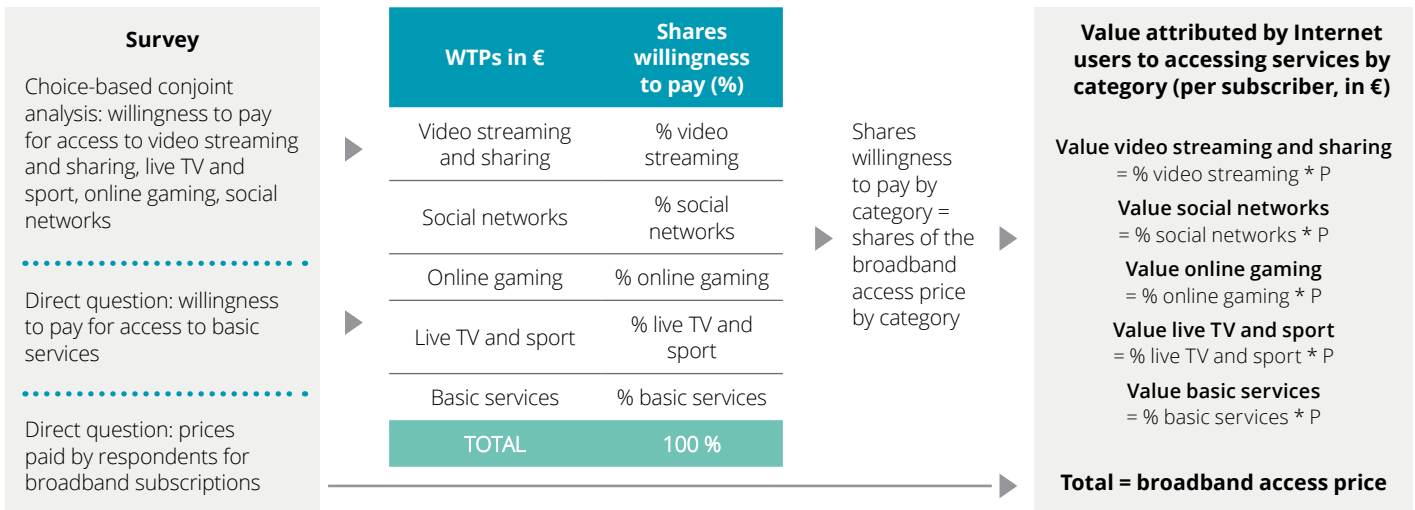
#### Overall approach to deriving willingness to pay and value attributed by Internet users to accessing each category of service

As shown in Figure 2 below, we use consumer survey data to estimate the willingness to pay for each category of service that can be accessed with a broadband subscription. The willingness to pay is the maximum price at or below which a consumer will buy a good or service. It hence reflects how people value access to the different types of services that they access through a broadband subscription. Since suppliers are only able to extract a share of the willingness to pay of consumers (for example because of the level of competition in the sector), the total willingness to pay for a subscription is higher than the price actually paid by the consumer.

The consumer survey provides absolute willingness to pay values for each of the categories of services that we consider can be accessed through a broadband subscription, as well as a total willingness to pay value (equal to the sum of the values of each category). With this information, we compute the proportional willingness to pay that consumers associate with each category of service. These proportional values represent the share of the subscription price that consumers attribute to each category of service. Multiplying these proportional values by the average subscription price obtained from the survey, one can derive the absolute value that consumers attribute to accessing each category of service.

<sup>21</sup> Indeed, for example, an article by several ISPs CEO published in February 2022 in the Financial Times states that "Today, video streaming, gaming and social media originated by a few digital content platforms account for over 70 per cent of all traffic running over the networks". Letter: Europe's telecoms market risks falling behind rivals. Financial Times, February 2022. Signed by José María Álvarez-Pallete López, Chairman and Chief Executive, Telefonica; Tim Höttges, Chief Executive, Deutsche Telekom; Nick Read, Chief Executive, Vodafone; Stéphane Richard, Chairman and Chief Executive, Orange. Available at the following link: <https://www.ft.com/content/68f989f5-96e6-440e-90f4-2a11840d9c99>.

Figure 2  
Methodology



Source: Deloitte Finance

It should be noted that with our approach, the total value attributed by Internet users to accessing broadband services is equal to the price they pay. This approach hence underestimates the value that Internet users place on the services offered by CAPs, as users will generally have a higher willingness to pay for accessing these services than the price they pay for a broadband subscription.

### 2.2 Design and implementation of the survey

Mobile and fixed broadband are often bought separately by customers.<sup>22</sup> In practice, Internet users can offset a service unavailable on mobile broadband with fixed broadband and vice versa. Moreover, both broadband accesses can be used in different ways (unlimited broadband for fixed access for instance). Consequently, we assessed the relative willingness to pay for access to each category of service separately for mobile and fixed broadband. We designed two surveys, one focusing on fixed broadband and another focusing on mobile broadband subscriptions.

Both questionnaires were organized in the same way. They start with questions on the socio-demographic profile of the

respondent. These questions are useful for our polling partner IFOP to follow quotas and ensure that the samples of respondents are representative of national populations. Then both questionnaires have a few questions on how people use their broadband connection (which usages and at which frequency). These questions are followed by the choice-based conjoint analysis questions: each respondent is asked 8 questions, thereby completing 8 choice tasks between hypothetical subscriptions. Finally, a direct question on respondents' willingness to pay for basic services is asked.

We present first the design of the choice-based conjoint analysis questions and then the data collection process.

<sup>22</sup> This is supported by the data collected with our surveys (except in Spain). In the mobile broadband survey, 57% of respondents in France did not buy fixed broadband access with their mobile package. These figures are 62% in Germany, 73% in Italy and 22% in Spain. In the fixed broadband survey, 62% of respondents in France did not buy mobile broadband access with their fixed broadband subscription. These figures are 79% in Germany, 79% in Italy and 26% in Spain.

## Survey design: focus on choice-based conjoint analysis

Several competing approaches for measuring willingness to pay have been used in the marketing and economics literature. Methods that rely on survey data are called stated-preference methods, as opposed to revealed-preference methods, which rely on market data (choices observed in real life). Survey data can measure respondents' willingness to pay using two categories of questions: direct questions or indirect questions. In direct questions, people are directly asked about the maximum amount that they would agree to pay to buy a good or a service. In indirect questions, respondents are asked to rate or choose different products or combinations of products. Observed choices are then used to estimate respondents' preferences, from which willingness to pay is derived.

Conjoint analysis is an example of an indirect survey method. It covers a broad range of techniques and has become one of the most widely used quantitative tools in marketing research.<sup>23</sup> Among the different types of conjoint analysis methods, choice-based conjoint analysis is the most widely used and is best adapted to mimic the choices made by consumers when buying a product in real life (the method is described in more detail in Box 1).

Choice-based conjoint analysis was chosen in this study to evaluate internet users' willingness to pay for their internet subscription to access to "video streaming and sharing", "social networks", "online gaming" and "live TV and sport". This indirect approach to obtain preferences and calculate willingness to pay has proven to be suitable for capturing realistic preferences since it mimics the choice that people make in real life when subscribing to a service.

Choice-based conjoint analysis enables to calculate the marginal utilities associated

### Box 1.

#### Choice-based conjoint analysis: overview of the method

Choice-based conjoint analysis is a stated-preference survey method that can be used to obtain responses that reveal respondents' preferences for product characteristics.<sup>24</sup> The logic behind this method is that a good or service can be broken down into several characteristics which are called **attributes** (e.g., price, brand, shape, color). Each attribute can comprise several modalities called levels (black, gray, or blue for the color for instance).

A product is a possible combination of attributes and levels, and a **menu** is a combination of several products (most often two products). The method consists in conducting a survey that presents menus with different combinations of products and asking the respondent to choose between these products. This action is called a **choice task** and is repeated several times, each time asking the same respondent to choose between two different products.

The method assumes that when choosing a product, respondents trade off the relative value of the different attribute levels (i.e., features) included in that product and choose the product with the highest utility.

The objective of the survey is to obtain the relative value (weight) placed by each respondent on each attribute included in the product. These relative levels of importance of the attributes, or **attribute weights**, reflect "the strength of preference for changes in attribute levels" (or "part-worth utilities")<sup>25</sup>.

with the different characteristics (attributes) of a product with respect to a reference product. In the present case, the attributes of the product are (1) access to video streaming and sharing through the broadband subscription, (2) access to social networks through the broadband subscription, (3) access to online gaming through the broadband subscription, (4) access to live TV and sport through the broadband subscription, and (5) the price of the product. The method is suited to estimate, for each category, how much respondents would be ready to pay for a broadband subscription with/without access to these categories of services. The reference product is the subscription without access to all these categories of services. In other words, the reference product is a subscription that only gives access to "basic services". Hence, the willingness to pay for access to "basic services" cannot be estimated using the choice-based conjoint analysis data. Instead, it was estimated using a direct question.

The question that was included in the questionnaire is the following:

*"You have indicated that you pay your internet subscription €XX per month. How much would you be willing to pay at most for the same subscription without having access to the following content services: video streaming and sharing, TV streaming and live sport, social networks and online games?"*

<sup>23</sup> Note that other elicitation methods for stated preferences exist, such as focus groups, vignette analysis and measurement of subjective well-being. Ben-Akiva Moshe, Mc Fadden Daniel and Train Kenneth (2019) Foundations of Stated Preference Elicitation: Consumer Behavior and Choice-based Conjoint Analysis Foundations and Trends in Econometrics, 10(1-2), p. 1-144.

<sup>24</sup> See for more details: Ben-Akiva Moshe, Mc Fadden Daniel and Train Kenneth (2019) Foundations of Stated Preference Elicitation: Consumer Behavior and Choice-based Conjoint Analysis Foundations and Trends in Econometrics, 10(1-2), p. 1-144.

<sup>25</sup> Hauber Brett, Marcos González Juan, Groothuis-Oudshoorn Catharina, Prior Thomas, Marshall Deborah, Cunningham Charles, IJzerman Maarten and Bridges John (2016) Statistical Methods for the Analysis of Discrete Choice Experiments: A Report of the ISPOR Conjoint Analysis Good Research Practices Task Force. Value in Health, 19(4).

This question, combined with the price declared by the respondent, gives the value that respondents are willing to pay for their broadband subscriptions, without the possibility of accessing “video streaming and sharing”, “social networks”, “online gaming” and “live TV and sport”.

In summary, the survey data enables to calculate Internet users’ willingness to pay for access to “video streaming and sharing”, “social networks”, “online gaming” and “live TV and sport” (through choice-based conjoint analysis) and for “basic services” (through a direct question).

To do this, choice-based conjoint analysis questions consist of choosing between hypothetical subscriptions with different profiles in terms of accessible services and prices. The purpose of these questions is to get respondents to make a trade-off between price and features of broadband connections in order to identify how these different features are valued.

As a reminder (see Box 1), a good or service can be broken down into several characteristics which are called attributes (e.g., price, brand, shape, color). Each

attribute can comprise several modalities called levels (black, gray, or blue for the color for instance).

When designing the questions, choices had to be made in: (1) the selection of attributes (features) of the broadband subscriptions (e.g., prices, accessible services) and their levels (e.g., access at all times, not in the evening, never) and (2) the experimental design (i.e., the construction of profiles and choice tasks).<sup>26,27,28</sup>

Concerning the selection and definition of attributes, we applied the best practices from the existing literature in identifying attributes: their number is limited to keep the task reasonable for respondents, they are non-redundant (in the sense that they do not refer to the same characteristic of a product), are clearly defined to respondents and easily understandable, and realistic so that respondents can picture themselves buying the product.<sup>29</sup> In the present case, five attributes were defined: access to “video streaming and sharing”, access to “social networks”, access to “online gaming”, access to “streaming live TV and sport”, and price.

After choosing attributes, their levels (i.e., the modalities that attributes can take) had to be determined. Levels of attributes can be determined by the degree of detail required for the study. The number of attribute levels is usually kept between 2 and 4. For continuous attributes (typically price), the number of levels and the range of attribute values must be chosen such that they cover the range observed in existing markets. We tested three levels for each attribute, related to the possibility to access online services: “at all times”, “not in the evening” and “never”. The idea is to test whether respondents are willing to pay for access to certain categories of services at all times, during the day, and outside of peak hours. Four levels of prices were chosen, and the range of prices was constructed to cover the existing range of prices in each country.

The following table presents the attributes and the levels used in each version of the questionnaire, namely in the fixed broadband questionnaire and the mobile broadband questionnaire, and for each country.

Table 1

### Attributes and levels in the survey

Attribute	Levels
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	At all times   Not in the evening   Never
Access to social networks (TikTok, Facebook, etc.)	At all times   Not in the evening   Never
Access to online gaming (PlayStation Plus, etc.)	At all times   Not in the evening   Never
Access to streaming live TV and sport	At all times   Not in the evening   Never
Price	€15   €30   €40   €55 (France – fixed broadband) €15   €30   €50   €80 (Germany – fixed broadband) €20   €30   €40   €50 (Spain – fixed broadband) €10   €20   €30   €40 (Italy – fixed broadband) €10   €20   €40   €60 (France – mobile broadband) €15   €30   €50   €80 (Germany – mobile broadband) €10   €20   €30   €40 (Spain – mobile broadband) €5   €10   €30   €40 (Italy – mobile broadband)

Source: Deloitte Finance

<sup>26</sup> Molin Eric (2011) Conjoint Analysis, in The Measurement and Analysis of Housing Preference and Choice (ed.) Hansen, Coolen and Goetgeluk. Springer, chapter 6. Available at the following link: <https://library.oapen.org/bitstream/handle/20.500.12657/34541/1/413366.pdf>.

<sup>27</sup> Ben-Akiva Moshe, Mc Fadden Daniel and Train Kenneth (2019) Foundations of Stated Preference Elicitation: Consumer Behavior and Choice-based Conjoint Analysis Foundations and Trends in Econometrics, 10(1-2), p. 1-144.

<sup>28</sup> Bliemer Rose (2014) Designing and Conducting Stated Choice Experiments, in Hess, S, and Daly, A; (eds) Handbook of Choice Modelling, Second edition. Available at the following link: <https://surveyengine.com/wp-content/uploads/2021/11/Designing-and-Conducting-Stated-Choice-Experiments.pdf>.

<sup>29</sup> Molin Eric (2011) Conjoint Analysis, in The Measurement and Analysis of Housing Preference and Choice (ed.) Hansen, Coolen and Goetgeluk. Springer, chapter 6. Available at the following link: <https://library.oapen.org/bitstream/handle/20.500.12657/34541/1/413366.pdf>.

The attributes relating to the categories of services accessible with a given broadband subscription were defined in the questionnaire to avoid ambiguity for the respondent on the services available within each category and the companies providing the services. They were formulated as follows:

- access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.),
- access to social networks (TikTok, Facebook, etc.),
- access to online gaming (PlayStation plus, etc.),
- access to streaming live TV and sport.

A presentation of the choice-based conjoint analysis questions was included to explain the logic of the questions to respondents. This presentation in particular explained:

- the choice that the respondents would have to make and the possible attributes of the subscriptions,
- that the price did not include the subscription to any of the paid services available on the Internet (e.g., the price of a Netflix or Amazon Prime Video subscription), but simply the possibility to access these services with their broadband connection,
- that any omitted characteristics of the subscriptions should be assumed to be identical across all alternatives.

Furthermore, both the presentation and the choice tasks explicitly included the names of the applications comprised in each category. For instance, it was made clear that the “video streaming and sharing” category included the main CAPs such as YouTube, Netflix, Prime Video and Disney+.

The questionnaire presentation that was displayed to respondents just before the questions is shown in Figure 3.

An example of a choice task is presented in Figure 4. Note that the category “access to basic services” is not an attribute of the choice-based conjoint analysis study since it does not vary between subscriptions (this access is always available “at all times”). This category was added in the menus to make it clear to respondents that, in all cases, they have access to basic services in the package that they choose.

Figure 3

**Extract from the fixed broadband questionnaire – presentation**

Imagine a fictitious situation in which you must choose a new fixed internet access subscription. In each of the following questions, you will have the opportunity to choose between two options for the subscription.

Each subscription is characterized by:

- A monthly price
- The ability to access basic internet services, meaning browsing the web, reading and answering to emails, making calls, shopping online, making videoconferences, etc.
- The ability to have a full access to the services, meaning video platforms (e.g. on YouTube, Netflix, Prime Video, Disney+, etc.), social networks (e.g. Facebook, Instagram, TikTok, etc.), online games (e.g. Xbox Live, PlayStation Plus, etc.), or streaming live TV (e.g. live streamed TV channel)
- The time of day during which these services can be accessed

The other characteristics of the subscriptions are the same between the two subscriptions offered (operator, connection technology, number of repeaters, number of TV channels, type of box (design, storage, etc.), sound and image quality, telephony, commitment time, download speed, connection reliability, etc.)

Note we only speak about the ability to access the services and not subscriptions to them (for example the subscription price does not include Netflix, Amazon Prime Video...)

Take the time to read the questions carefully and try to answer as best you can!

Figure 4

**Extract of fixed broadband questionnaire – example of question**

**Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

	Package A	Package B
Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	At all times	At all times
Access to social networks (TikTok, Facebook, etc.)	Never	At all times
Access to online gaming (PlayStation plus, etc.)	Never	At all times
Access to streaming live TV and sport	Never	At all times
Price	€20 / month	€50 / month
<b>Response</b>	<input type="radio"/>	<input checked="" type="radio"/>

Concerning the experimental design of the survey, it required choosing the number of choice tasks presented to each respondent, the number of products in each menu and the attribute levels in each product.

Concerning the number of choice tasks to include in each questionnaire, 8 choice tasks per questionnaire were included, meaning 8 questions per respondent. This choice was made in collaboration with IFOP to keep the questionnaire to a reasonable length and ensure that respondents would remain focused until the end of the questionnaire, while gathering enough information.

Regarding the number of products in each menu, we included 2 alternative products in each menu to limit the cognitive burden placed on respondents. This is in line with the standard practice in the literature, which consists of including two or three alternatives.

Concerning the construction of the products themselves, that is, the distribution of attribute levels in each product, it was not possible to include all the possible combinations of attribute levels (full fractional design) because there were too many possible combinations (324 with 5 attributes with respectively 3, 3, 3 and 4 levels). To reduce the number of products presented to respondents and to construct choice sets to maximize the precision of the estimates of the econometric models, we used the most common design, which is the D-efficient design. This design finds the optimal set of questions amongst all possible questions. To increase the number of different choice tasks performed in total by respondents, the optimal design was split into 4 parts called "blocks", each block representing a different version of the choice experiment. Hence, in total, 32 choice tasks were identified (8 choice tasks per questionnaire with 4 different versions of each questionnaire). The optimal design

was obtained using the Stata<sup>30</sup> user-written command "dcreate"<sup>31</sup>, specifying 32 choice tasks, with 4 blocks of respondents and 2 products by choice set. The design was also made such that attribute levels were balanced. Hence, each attribute level appears an equal number of times across all choice tasks.

**Data collection**

We collected data in four European countries: France, Germany, Italy, and Spain. These countries were chosen because they are the European countries with the highest number of fixed broadband subscribers (according to the ITU - International Telecommunication Union -, 37 million in Germany, 31 million in France, 18 million in Italy and 17 million in Spain in 2021, hence 62% of fixed broadband subscriptions in Europe). The operational part of the survey (questionnaire coding and data collection) was performed by IFOP. Data were collected through an online survey.

The target population was Internet users with a broadband connection.<sup>32</sup> Respondents with both a fixed and mobile broadband connection were randomly assigned to the fixed broadband or mobile questionnaire. Those with just one type of broadband connection were assigned to the relevant questionnaire. Respondents were distributed among the different versions of the questionnaires ensuring that each block had the same number of respondents. In total, each questionnaire has 800 respondents.

Our partner IFOP assessed the demographic characteristics of the samples of respondents to each questionnaire during the realization of the field part of the surveys to ensure that they were representative of the national population in each country. In line with the standard practice, we used the following demographic characteristics: gender, age, region, size of city and socio-professional category in France and gender, age, region

and income in Germany, Italy, and Spain.<sup>33</sup> People younger than 18 years of age were not surveyed.<sup>34</sup>

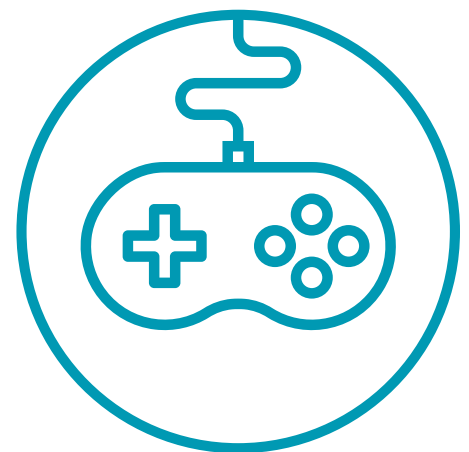
We collected the survey data during the periods presented in the following table.

Table 2  
**Data collection periods**

Country	Beginning	End
France	May 15, 2023	May 23, 2023
Germany	May 25, 2023	June 1, 2023
Italy	May 25, 2023	June 1, 2023
Spain	May 23, 2023	June 6, 2023

Source: Deloitte Finance

The online survey took about 5-7 minutes to complete. The questionnaires used in France are available in Appendix 1: Fixed Internet survey and Appendix 2: Mobile Internet survey. The questionnaires used in Germany, Spain and Italy are the same, except that price levels reflected the prices in each country.



<sup>30</sup> The statistical software Stata version 17 was used.

<sup>31</sup> Arne Risa Hole (2016) Creating efficient designs for discrete choice experiments. Nordic and Baltic Stata Users Group meeting. See also: DCREATE: Stata module to create efficient designs for discrete choice experiments. Arne Risa Hole. Available at the following link: <https://ideas.repec.org/c/boc/bocode/s458059.html>.

<sup>32</sup> People over 18 years old who do not work in advertising or marketing, market research, telecom operator or media and entertainment and who has a fixed internet connection at home and/or a mobile internet connection.

<sup>33</sup> Note that the dimensions used to obtain representative samples of the national populations differ between countries. IFOP told us that it depends on the standard practice in each country.

<sup>34</sup> Minors are usually excluded from surveys because they can be interviewed only within certain legal limits (e.g., with parental permission or in presence of the parent).



### 2.3 Data and descriptive statistics

#### Data

The output of the survey is 8 unique datasets: one dataset on mobile broadband and one dataset on fixed broadband for each country (France, Germany, Spain, and Italy). Each dataset counts 800 observations and constitutes a representative sample of the national population.

Respondents who declared subscription prices below €10 and above €100 for fixed broadband and above €100 for mobile broadband were excluded from the initial samples so that final samples contain just under 800 observations.<sup>35</sup> A table of summary statistics on the demographic profile of each final sample is presented below.

<sup>35</sup> Precisely, for mobile broadband: 791 in France, 775 in Germany, 793 in Italy and 737 in Spain and for fixed broadband: 793 in France, 779 in Germany, 787 in Italy and 740 in Spain.



Table 3  
**Respondent demographics, summary statistics**

	France		Germany		Italy		Spain	
	Fixed broadband	Mobile broadband	Fixed broadband	Mobile broadband	Fixed broadband	Mobile broadband	Fixed broadband	Mobile broadband
<b>Gender</b>								
Women	52%	52%	51%	50%	51%	54%	51%	51%
Men	48%	48%	49%	50%	49%	46%	49%	49%
<b>Age</b>	48	48	49	48	48	48	47	47
<b>Profession</b>								
Farmer	2%	1%	0%	0%	0%	0%	1%	1%
Craftsman/ shopkeeper/ entrepreneur	3%	4%	4%	2%	4%	3%	2%	2%
Employee	22%	20%	36%	42%	29%	29%	39%	37%
Inactive	17%	15%	12%	14%	21%	25%	20%	21%
Intermediate occupation	9%	12%	7%	6%	3%	3%	11%	13%
Liberal profession/ executive/ higher intellectual profession	9%	9%	6%	6%	9%	7%	8%	8%
Worker	13%	13%	5%	4%	12%	13%	4%	1%
Retired	26%	26%	31%	25%	22%	19%	17%	17%
<b>Number of people in home</b>								
1 person	25%	25%	34%	32%	12%	12%	15%	14%
2 people	41%	37%	40%	37%	32%	31%	34%	31%
3 people	16%	16%	13%	16%	29%	29%	28%	27%
4 people or more	19%	23%	13%	14%	27%	27%	23%	28%
<b>Number of children in home</b>								
None	73%	67%	81%	80%	71%	70%	71%	68%
1 child	16%	16%	12%	12%	18%	18%	19%	20%
2 children or more	12%	16%	7%	8%	11%	12%	10%	12%
<b>Has a fixed Internet connection</b>	100%	92%	100%	90%	100%	77%	100%	91%
<b>Has a mobile Internet connection</b>	75%	100%	69%	100%	84%	100%	88%	100%
<b>Number of observations</b>	<b>793</b>	<b>791</b>	<b>779</b>	<b>775</b>	<b>787</b>	<b>793</b>	<b>740</b>	<b>737</b>

Source: Deloitte Finance

## Prices

Prices were collected in the fixed broadband survey with the question:

*“You told us you have a fixed internet connection at your home. How much does your fixed internet package cost you every month (indicate the total price of the subscription without cents)?”*

Then, in a follow-up question, respondents were asked what other services were included in their fixed broadband subscription. Several choices were offered to them: TV box, fixed telephony, mobile phone plan, subscription to streaming music, pay TV channels, SVOD services and other services.

To ensure that the calculated average prices do not include services other than a standalone broadband subscription (e.g., TV box, subscription to a streaming music or video platform, etc.), the answers of respondents who stated they had other services included in their subscription have been removed from the dataset to calculate average prices.<sup>36</sup> Regarding

mobile broadband, prices paid by respondents who declared having a bundle “Internet at home and mobile” were also excluded to calculate average prices.<sup>37</sup> Note that these samples were only used to compute average prices and willingness to pay for basic services and were not used for the rest of the analysis, in particular for the econometric analysis.

### Willingness to pay for basic services

The willingness to pay for access to “basic services”<sup>38</sup> was estimated using a direct question. More precisely, respondents had to select the range that best reflected their willingness to pay for their current broadband subscription, assuming that the access to the following services would be blocked: “video streaming and sharing”, “social networks”, “online gaming” and “live TV and sport”. The ranges offered to the respondents extended from [0% - 10%] to [90% - 100%] of the subscription price. The willingness to pay for access to “basic services” was obtained by multiplying the middle of the selected range (e.g., 95% if the respondent selected the [90% - 100%] range) by the subscription price declared. Respondents who had additional services in their subscriptions were excluded from the sample.

## 2.4 Econometric modelling for choice-based conjoint analysis

This section presents the econometric model to estimate willingness to pay with the choice-based conjoint analysis data and the results.

### Model and estimation procedure

The objective of the econometric model is to calculate respondents’ willingness to pay to access each category of services. To do so, the survey data on choices between fixed/mobile packages are used to estimate the parameters of a utility function, which links the satisfaction of the respondent with the characteristics of a given offer.

The utility function is estimated using the conditional logit model and the mixed multinomial logit model for each country and separately for the mobile and fixed broadband surveys. The models and estimation procedures are detailed in Box 2.



<sup>36</sup> We also removed respondents who indicated in the survey that they did not know the price of their subscription. We are left with the following number of observations: 359 in France, 533 in Germany, 525 in Italy and 132 in Spain.

<sup>37</sup> We also removed respondents who indicated in the survey that they did not know the price of their subscription. We are left with the following number of observations: 450 in France, 479 in Germany, 581 in Italy and 160 in Spain.

<sup>38</sup> All internet content except video streaming and sharing, social networks, online gaming and live TV and sport.

**Box 2.**

**Model and estimation procedure**

**The Utility function and Conditional logit**

The baseline model for the analysis of discrete choice data is the conditional logit model of Mc Fadden (1973<sup>39</sup>, 2001<sup>40</sup>). This model relates the probability of choice among two or more products to the attribute levels of these products.

Using random utility theory, the model assumes that the utility associated with a product/service can be broken down into an observed component ( $V$ ) which is a function of observed attribute levels, and an unobserved component ( $\epsilon$ ). Specifically, the utility that respondent  $i$  derives from choosing alternative  $j$  in choice scenario  $s$  is given by:

$$U_{ijs} = V_{ijs} + \epsilon_{ijs}; i = 1, \dots, N; s = 1, \dots, S; j = 1, 2$$

where:

- there are  $N$  decision-makers choosing amongst 2 alternatives across  $S$  scenarios,
- $U_{ijs}$  represents the utility of individual  $i$  for the alternative  $j$  in scenario  $s$ ,
- $V_{ijs}$  represents the observed component of utility. It is a function of the attribute levels of alternative  $j$ ,
- $\epsilon_{ijs}$  is the unobserved component of utility. It represents characteristics unknown to the researcher, measurement error and/or heterogeneity of tastes in the sample.

In this framework, it is assumed that when faced with a choice between two alternatives, each individual chooses the alternative that maximizes his utility. Hence alternative  $j$  is chosen over alternative  $k$  if  $U_{ijs} > U_{iks}$  for all  $k \neq j$ .

The probability that individual  $i$  chooses alternative  $j$  rather than alternative  $k$  is the probability that the utility associated with  $j$  is higher than the utility associated with  $k$ . Thus, the probability of individual  $i$  choosing alternative  $j$  in scenario  $s$  is modeled as:

$$(2) P(\text{choice}_{is} = j) = P(U_{ijs} > U_{iks}), \text{ for all } k \neq j$$

Different discrete choice models are obtained from different assumptions about the distribution of the random terms. Under the assumption that the random terms are independently and identically distributed type-I extreme value, we obtain the conditional logit model: the probability of choosing  $j$  takes the multinomial logit form:

$$(3) P_{ijs} = \exp(V_{ijs}) / (\exp(V_{is1}) + \exp(V_{is2}))$$

The observed component of utility  $V_{ijs}$  is usually specified to be linear in the alternative attributes. The utility that respondent  $i$  derives from choosing alternative  $j$  in choice scenario  $s$  is given by:

$$(4) V_{ijs} = \alpha + \beta_1 X_{1ijs} + \dots + \beta_K X_{Kijs} + \beta_p \text{Price}_{ijs}$$

where:

- $\alpha$  is a constant,
- $\beta_1, \dots, \beta_K$  are coefficients of attributes  $X_{1ijs}, \dots, X_{Kijs}$  and  $\beta_p$  is the coefficient for the price of alternative  $j$ .

**Mixed multinomial logit**

Although the conditional logit model is the choice model most often applied, it has several well-known limitations: it cannot account for unobserved preference heterogeneity among respondents and has the Independence of Irrelevant Alternatives (IIA) property which can lead to unrealistic predictions. The IIA assumption implies that the relative probability of selecting alternatives should not change if we introduce or eliminate another alternative. Thus, the IIA assumption may pose problems in predicting correct choice probabilities for alternatives that are very similar, in other words that share characteristics that are not included in the model.

The more recently developed mixed logit model<sup>41</sup> extends the standard conditional logit model by making it possible to take heterogeneity among respondents into account and to relax the IIA assumption. It does so by using random coefficients to model the correlation of choices across alternatives. These coefficients indicate to what extent individual tastes are distributed around an estimated mean parameter and according to a specified distribution of these coefficients. An advantage of the mixed logit model is that it is extremely flexible.

This model was fitted using a command in Stata called `cmxtmixlogit` with Stata 17. This command is intended for fitting panel-data mixed logit models<sup>42</sup>. It estimates the parameters of the mixed logit model by maximum simulated likelihood. Not all variables were assigned as random parameters to have the model converge. Variables that had to be assigned as random parameters were identified by running first the user-written command `mixlogit` in Stata, assigning all variables as random parameters.

<sup>39</sup> Mc Fadden (1974) Conditional logit analysis of qualitative choice behavior, in *Frontiers of econometrics*, (Ed.) P. Zarembka. New York: Academic Press, p. 105-142. Available at the following link: <https://eml.berkeley.edu/reprints/mcfadden/zarembka.pdf>.  
<sup>40</sup> Mc Fadden (2001) Economic Choices. *The American Economic Review*, 91 (3), p. 351-378. Available at the following link: [http://users.auth.gr/users/5/9/018095/public\\_html/teaching/QuantMeth/McFadden2001.pdf](http://users.auth.gr/users/5/9/018095/public_html/teaching/QuantMeth/McFadden2001.pdf).  
<sup>41</sup> See for example: Mc Fadden, D. L. and K. E. Train (2000) Mixed MNL models for discrete response. *Journal of Applied Econometrics*, 15, p. 447-470. Available at the following link: [Mixed MNL models for discrete response - McFadden - 2000 - Journal of Applied Econometrics - Wiley Online Library](http://onlinelibrary.wiley.com/doi/10.1002/1097-4257(200007)15:4<447::AID-JAE447>3.0.CO;2-1).  
<sup>42</sup> See Stata Choice Models Reference Manual, Release 17, A Stata Press Publication StataCorp LLC College Station, Texas.

The utility function (for a broadband package) of a respondent is defined as follows:

$$U = \beta_0 + \beta_{vid1} \times video_{noevening} + \beta_{vid2} \times video_{atalltimes} + \beta_{netw1} \times socialNetwork_{noevening} + \beta_{netw2} \times socialNetwork_{atalltimes} + \beta_{game1} \times gaming_{noevening} + \beta_{game2} \times gaming_{atalltimes} + \beta_{tv1} \times liveTV_{noevening} + \beta_{tv2} \times liveTV_{atalltimes} + \beta_p \times price + \epsilon$$

where:

- $U$  is the utility/satisfaction
- $\beta_0$  is a constant
- $\beta$  are the coefficients which correspond to the satisfaction associated with the possibility to access each category of services (access to video streaming and sharing, access to social networks, etc.)
- $\beta_p$  corresponds to the satisfaction associated with an increase in price
- $\epsilon$  is a random disturbance

### Results of the econometric models

The results of the models are presented in the following tables (Table 4 and Table 5). The tables only present the results of the mixed multinomial logit model, as this model provides the best fit to the data according to the statistical tests that we performed.<sup>43</sup> It is also the best model according to the literature.

Table 4  
Coefficients of the utility function for each country – fixed broadband

Fixed broadband	(1)	(2)	(3)	(4)
	France	Germany	Italy	Spain
<b>Access to video streaming and sharing</b>				
Not in the evening	0.489*** (0.0494)	0.616*** (0.0570)	0.440*** (0.0473)	0.673*** (0.0527)
At all times	0.845*** (0.0594)	1.016*** (0.0735)	0.732*** (0.0565)	1.008*** (0.0669)
<b>Access to social networks</b>				
Not in the evening	0.365*** (0.0502)	0.319*** (0.0549)	0.313*** (0.0464)	0.510*** (0.0537)
At all times	0.599*** (0.0528)	0.701*** (0.0595)	0.615*** (0.0517)	0.825*** (0.0543)
<b>Access to online gaming</b>				
Not in the evening	0.105** (0.0497)	0.0361 (0.0558)	0.0405 (0.0467)	0.125** (0.0537)
At all times	0.263*** (0.0588)	0.272*** (0.0678)	0.328*** (0.0535)	0.362*** (0.0583)
<b>Access to live TV and sport</b>				
Not in the evening	0.149*** (0.0461)	0.227*** (0.0546)	0.0548 (0.0473)	0.285*** (0.0503)
At all times	0.516*** (0.0554)	0.614*** (0.0692)	0.320*** (0.0531)	0.584*** (0.0602)
Price	-0.0409*** (0.00242)	-0.0641*** (0.00311)	-0.0373*** (0.00227)	-0.0326*** (0.00238)
Constant	-0.124*** (0.0379)	-0.104** (0.0452)	-0.123*** (0.0378)	-0.0483 (0.0400)
Number of observations	12,688	12,464	12,592	11,840
Log simulated-pseudolikelihood	-3,618	-3,170	-3,662	-3,395

Note: Standard errors in parentheses, \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Standard errors are clustered at the respondent level.

Source: Deloitte Finance

<sup>43</sup> Results obtained with the conditional logit models are very similar.

Table 5  
Coefficients of the utility function for each country – mobile broadband

Mobile broadband	(1)	(2)	(3)	(4)
	France	Germany	Italy	Spain
<b>Access to video streaming and sharing</b>				
Not in the evening	0.419*** (0.0483)	0.360*** (0.0480)	0.482*** (0.0497)	0.557*** (0.0500)
At all times	0.547*** (0.0561)	0.680*** (0.0597)	0.646*** (0.0581)	0.944*** (0.0613)
<b>Access to social networks</b>				
Not in the evening	0.438*** (0.0504)	0.371*** (0.0502)	0.283*** (0.0474)	0.470*** (0.0503)
At all times	0.781*** (0.0599)	0.733*** (0.0585)	0.614*** (0.0543)	0.857*** (0.0540)
<b>Access to online gaming</b>				
Not in the evening	-0.0432 (0.0484)	0.0237 (0.0492)	-0.0449 (0.0489)	0.160*** (0.0463)
At all times	0.150** (0.0608)	0.243*** (0.0652)	0.156** (0.0609)	0.291*** (0.0565)
<b>Access to live TV and sport</b>				
Not in the evening	-0.0369 (0.0526)	-0.0439 (0.0585)	-0.0556 (0.0532)	0.0862* (0.0502)
At all times	0.287*** (0.0489)	0.282*** (0.0560)	0.243*** (0.0512)	0.420*** (0.0505)
Price	-0.0459*** (0.00245)	-0.0554*** (0.00268)	-0.0517*** (0.00247)	-0.0272*** (0.00191)
Constant	-0.0241 (0.0407)	-0.119*** (0.0435)	-0.0703* (0.0409)	0.0277 (0.0406)
Number of observations	12,656	12,400	12,688	11,792
Log simulated-pseudolikelihood	-3,354	-3,027	-3,199	-3,374

Note: Standard errors in parentheses, \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01.  
Standard errors are clustered at the respondent level.

Source: Deloitte Finance

The coefficients of the utility functions have the expected signs. The effect of access to additional services (video streaming and sharing, social networks, etc.) is always positive, thereby increasing utility. The effect of an increase in price is always negative, thereby decreasing utility. Coefficients associated with having access “at all times” compared to “not in the evening” are higher, meaning that having access to certain services at all times increases utility more than having access at all times except in the evening.

All the coefficients of the model associated with having the possibility to access services at all times are statistically significant at the one percent level, meaning that we can reject the hypothesis that they are equal to zero with confidence (there is only a 1% chance that we conclude that they are different from zero when actually they are not). Coefficients on “price” are also significant at the one percent level. These coefficients are used to calculate willingness to pay.

The coefficients of “access to live TV and sport at all times except in the evening” and “access to online gaming at all times but in the evening” are non-statistically significant at the 10% level, meaning that we cannot say with sufficient confidence that these coefficients are different from zero. Hence, having access to “live TV and sport or online gaming at all times except in the evening” does not increase the utility of respondents on average, compared to “not having access to these services”. It implies that people value “watching live TV and sport” and “play online games” in the evening and not during the day.

### Computing willingness to pay

The idea underlying the calculation of the willingness to pay is to find out by how much should monthly prices increase to compensate for a utility increase due to an improvement in another attribute, in order to keep the overall utility at the same level. The price increase can then be considered the willingness to pay for that attribute improvement.

We are interested in willingness to pay only for access at all times, hence we focus on these coefficients. The coefficient on access to each category of services is divided by the coefficient on price. For example:

$$WTP_{video} = \beta_{vid2} / \beta_p \text{ (see Box 3).}$$

### Box 3.

#### Computation of willingness to pay (WTP) from the coefficients of the model

The total derivative of the utility function  $U_{ijs}$  with respect to changes in attribute  $X_k$  and price is given by  $dU_{ijs} = \beta_k dX_k + \beta_p dPrice$ . Setting this expression equal to zero and solving for  $dPrice/dX_k$  yields the change in price that keeps utility unchanged given a change in  $X_k$ .

$$dPrice/dX_k = WTP_k = - \beta_k / \beta_p$$

Willingness to pay was calculated using the user-written Stata command “wtp”<sup>44</sup>, which calculates willingness to pay from the coefficients of the model and estimates confidence intervals using the delta method.

We obtain the willingness to pay to access each category, each country and for fixed broadband and mobile broadband.

We use the consumer survey data and the approach described earlier to compute the willingness to pay values for each of the categories of services that we consider can be accessed through a broadband subscription, as well as a total willingness to pay value (equal to the sum of the values of each category). With this information, we compute the proportional willingness to pay value that consumers associate to each category of service. These proportional values represent the share of the subscription price that consumers attribute to each category of service. Multiplying these proportional values by the average subscription price obtained from the survey one can derive the absolute value that consumers attribute to each category of service. These are inputs into the calculation of the total value that Internet users attribute to accessing services provided by CAPs, which we describe in more detail in the next section.

<sup>44</sup> For more information see: WTP: Stata module to estimate confidence intervals for willingness to pay. Written by Arne Rise Hole. Available at the following link: <https://ideas.repec.org/c/boc/bocode/s456808.html>.



# 3. Value attributed by Internet users to accessing services provided by large CAPs

This section explains the methodology used to compute the value attributed by Internet users to accessing services provided by large CAPs, meaning CAPs belonging to the categories “video streaming and sharing”, “social networks” and “online gaming”. We first focus on large CAPs (3.1) and then, within large CAPs, on a subset of Global CAPs (3.2).

## 3.1 Large CAPs

To compute the value attributed by Internet users to accessing services provided by large CAPs, we use the sum of the proportional valuations of the categories of video streaming and sharing, social networks and online gaming and multiply this by the average price of the subscription.

In order to build some sensitivity in our results, we derive a range of prices, with the lower and upper range value corresponding to the average broadband price in the country decreased and increased, respectively, by 25%.

To obtain values comparable to the network costs estimated in the FE study<sup>45</sup>, which estimates OTT traffic-related costs for fixed and mobile telecom networks across Europe, we first exclude VAT from the results (since VAT revenues are not kept by ISPs but transferred to the public treasury). We then obtain annual values multiplying the monthly results by 12.

## 3.2 Global CAPs

This section focuses on services that are supplied by Global CAPs. We first define the companies that we consider as Global CAPs, then calculate the shares that Global CAPs represent in each of the service category. Finally, we explain the methodology used to estimate the value attributed by Internet users to accessing the services provided by Global CAPs.

### Definition of Global CAPs

The European Commission and ETNO<sup>46</sup> use the term “Large Traffic Generators” to refer to companies representing significant shares of ISPs network traffic. The European Commission, in its public consultation, asked respondents to “specify the threshold above which [the respondent] would consider a company to constitute a so-called large traffic generator (“LTG”) based on the percentage level of traffic loaded on [the respondent’s] network during peak time traffic (or any other classification that [the respondent] may use)”.<sup>47</sup> In a report published in May 2023, ETNO and GSMA<sup>48</sup> indicate that “LTGs would only be those companies that account for more than 5% of an operator’s yearly average busy hour traffic measured at the individual network level”.<sup>49</sup> They add that other criteria could also be cumulatively added to the 5%, “such as the need of meeting the threshold in at least

three EU Member States, to reflect the overall impact on European networks”.<sup>50</sup>

BEREC<sup>51</sup> has used the terms “large CAPs” and “large traffic suppliers” to refer to the same players. In its answer to the consultation of the European Commission, BEREC<sup>52</sup> explained in a disclaimer that: “the term “large traffic generators” could be construed as a pejorative term and data is delivered at the request of end users. As such, these CAPs might better be labelled as large traffic suppliers (LTSs)”. BEREC also uses the term “large CAPs”, when referring for example to the “financial contributions from large CAPs to ISPs”.<sup>53</sup>

In this report, we do not intend to take a position on which term is the most appropriate, and we use the term “Global CAPs” to refer to the companies supplying the most broadly successful services and thereby naturally associated with the largest shares of network traffic. For this, we use the 2023 Sandvine report, which is broadly used as a reference in the telecommunication sector and, more specifically, has been referred to in the reports mentioned earlier supporting ETNO and GSMA. We have retained as Global CAPs: Alphabet, whose customers represented, according to the Sandvine report, 13.85% of global traffic in 2022, Netflix (13.74%), Meta (6.45%), Microsoft (5.11%), Apple (4.59%), Amazon (4.24%), Disney+ (4.20%) and ByteDance (TikTok,

<sup>45</sup> Frontier Economics, Estimating OTT traffic-related costs on European telecommunications networks, April 7, 2022. It should be emphasized that the results of this study are used as a point of comparison since the study is prominently referenced in the debate, having been reused by ISPs in particular. This does not mean that we endorse the results of this study.

<sup>46</sup> European Telecommunications Network Operators.

<sup>47</sup> “specify the threshold above which you would consider a company to constitute a so-called large traffic generator (“LTG”) based on the percentage level of traffic loaded on your network during peak time traffic (or any other classification that you may use)”.

<sup>48</sup> GSMA: GSM Association or Global System for Mobile Communications.

<sup>49</sup> ETNO/ GSMA, Summary of the Joint Telecom Industry Response to the EU consultation on “The future of the electronic communications sector and its infrastructure”, May 2023.

<sup>50</sup> Ibid.

<sup>51</sup> Body of European Regulators for Electronic Communications.

<sup>52</sup> Body of European Regulators for Electronic Communications.

<sup>53</sup> BEREC, BEREC’s Response to the Exploratory Consultation, BoR (23) 131b, May 19, 2023.



3.55%). This list is presented in the following table.

Table 6  
Global CAPs considered for this study

Global CAPs
Netflix
Microsoft
Alphabet (Google)
Meta (Facebook)
Amazon
Apple
Disney+
ByteDance (TikTok)

Source: Deloitte Finance

**Shares of Global CAPs in data-intensive categories of services**

The approach we follow to determine the value attributed by Internet users to Global CAPs consists of estimating the share of each category of service in our consumer survey that can be attributed to Global CAPs. For this, we used several sources of information (e.g., Sandvine<sup>54</sup>, regulators such as ARCEP<sup>55</sup>, Axon Partners Group<sup>56</sup>, BNetZa<sup>57</sup>, BEREC<sup>58</sup>, Cisco<sup>59</sup>, Ericsson<sup>60</sup>, Statista, DataReportal, etc.) to determine the shares of Global CAPs in the categories “video streaming and sharing”, “social networks” and “online gaming”. These sources cover broadband traffic data, revenue data and consumption data (time spent on websites).

It is important to emphasize that our approach underestimates the value attributed by Internet users to accessing services provided by Global CAPs

because Global CAPs are also active in the categories of services “live TV and sport” and “basic services”, even though the values that Internet users attribute to these categories are not taken into account in our calculations. Amazon Prime Video for example provides the possibility for Internet users to watch French tennis tournament Rolland Garros or French Ligue 1 football live and Alphabet owns services such as Waze and Gmail, Amazon owns Amazon online stores or Microsoft provides, for example, Teams, Outlook or Skype.

Following the review of the different sources of information available, we can make the following observations:

- First, the number of publicly available data on broadband traffic by company and by type of services (video streaming and sharing, social networks, etc.) is limited.
- Second, most of the public reports consulted (ETNO<sup>61</sup>, Bnetza<sup>62</sup>, BEREC<sup>63</sup>, etc.) refer to the data of Sandvine, and in particular the data reported in Sandvine’s yearly reports called “The Global internet phenomena report”.<sup>64</sup>
- Third, the best proxy available for the share of value that Internet users attribute to traffic-intensive Global CAPs is their share of traffic in the three categories of services that we associate with Global CAPs. No other public data is systematically available to isolate the share of Global CAPs.
- Fourth, to our knowledge, national telecommunication regulators in Germany, Spain and Italy do not publish data on the broadband traffic breakdown by company and services type. Only the French regulator ARCEP publishes this

data in a yearly report called “Baromètre de l’interconnexion de données en France”.<sup>65</sup> The last report was published on July 4, 2023. In the breakdown of traffic published by ARCEP, the traffic of CDNs and transit players (Akamai, Lumen, etc.) is a separate category, while these players do not appear explicitly in the Sandvine data. ARCEP also does not provide a breakdown of the traffic associated with Google, Amazon, Meta, Apple and Microsoft by type of services and by source (for the case of third-party traffic).

Our conclusions from the extensive research we carried out to compile the available data are that (1) there is no standardized publicly available data at the operator level, or even at the country level, on the shares that Global CAPs represent in all the traffic and by category of services, (2) Sandvine data can be considered the most reliable data publicly available.

Sandvine’s reports include traffic data at several geographical levels: world, Americas, APAC and EMEA. In this report, we chose to use the data at the global level. A comparison between traffic attributed to GAFAM in France in the ARCEP report and at the global and EMEA level in Sandvine’s report shows that global data are closer to the French values. We deduce from this comparison that the global level is more representative of the European countries concerned (France, Spain, Italy and Germany) than the EMEA level.

The shares of Global CAPs by category are computed using data from Sandvine’s “The global internet phenomena report January 2023”. In particular, we use data from the Sandvine report at company level, app level and service type level, as presented in the following table.

<sup>54</sup> Sandvine, The Global internet phenomena report, January 2023.

<sup>55</sup> ARCEP, L’état d’internet en France, 2023.

<sup>56</sup> Axon Partners Group, Europe’s internet ecosystem: socio-economic benefits of a fairer balance between tech giants and telecom operators, May 2022.

<sup>57</sup> WIK-Consult (study for the Federal Network Agency Germany), Competitive conditions on transit and peering markets. Implications for European digital sovereignty, 02/28/2022.

<sup>58</sup> BEREC, BEREC Report on IP-Interconnection practices in the Context of Net Neutrality, October 5, 2017

<sup>59</sup> Cisco, Annual Internet Report (2018-2023) White Paper, 2020.

<sup>60</sup> Ericsson, Ericsson Mobility Report, June 2023.

<sup>61</sup> Axon Partners Group, “Europe’s internet ecosystem: socio-economic benefits of a fairer balance between tech giants and telecom operators”, May 2022 (Link to the report: [Study on the implications of an unbalanced IP traffic market on European socio-economic welfare \(etno.eu\)](#)).

<sup>62</sup> [WIK Report \(bundesnetzagentur.de\)](#).

<sup>63</sup> [Draft BEREC Report on IP-Interconnection practices in the Context of Net Neutrality \(europa.eu\)](#).

<sup>64</sup> Sandvine, The Global internet phenomena report, January 2023.

<sup>65</sup> ARCEP, Baromètre de l’interconnexion de données en France, 04 juillet 2023.

Table 7  
Traffic data – Sandvine 2022 World

Company level		App level		Service type level	
Traffic by company	2022	Traffic by app	2022	Traffic by service type	2022
Alphabet	15%	Netflix	14%	Video	66%
Netflix	14%	YouTube	11%	Marketplace	6%
Meta	6%	Generic QUIC	5%	Gaming	6%
Microsoft	5%	HTTP	4%	Social Networking	5%
Apple	5%	Disney+	4%	Cloud	5%
Amazon	4%	TikTok	4%	Web Browsing	5%
		Facebook	3%	File Sharing	3%
		Xbox Live	3%	Messaging	2%
		PlayStation Downloads	3%	VPN	1%
		Amazon Prime	3%	Audio	1%
		Hulu	3%		
		Facebook Video	2%		
		Operator Content	2%		

Source: Sandvine data, The Global internet phenomena report, January 2023, tables p.10, p.13, p.14, p.15

For each share of Global CAPs that we want to assess, we determine a value according to the following assumptions.

**Service type: video streaming and sharing**

The share of Global CAPs in the “video streaming and sharing” category is calculated by dividing the share of Global CAPs in total traffic by the share of “video” in total traffic. The share of Global CAPs in total traffic corresponds to the sum of the shares of Netflix (13.74%), YouTube (10.51%), Disney+ (4.20%) and Amazon Prime<sup>66</sup> (2.67%)<sup>67</sup> in total traffic: 31%<sup>68</sup>. According to Sandvine, the share of “video” – which “includes TV, video, and streaming download” – in total traffic amounts to

60%.<sup>69</sup> As a result, these Global CAPs represent 52%<sup>70</sup> of the traffic of the “video streaming and sharing” category.

Note that since we consider the share of Global CAPs in a broad category that includes not only “video” but also “live TV” (and sport) – in which they have a small share – this percentage is underestimated, which in turn, leads to an underestimation of the value attributed to access to services of Global CAPs.<sup>71</sup>

**Service type: social networks**

The share of Global CAPs in the “social networks” category is calculated by dividing the share of Global CAPs in total traffic by the share of the Sandvine “social networking” category in total traffic. The

share of Global CAPs in total traffic corresponds to the sum of the shares of Facebook Video (1.98%), TikTok (3.55%) and Facebook (2.83%) in total traffic, which amounts to 8%. According to Sandvine, the share of “social networking” in total traffic amounts to 11%.<sup>72</sup> As a result, these Global CAPs represent 77%<sup>73</sup> of the traffic of the “social networks” category. Note that the share is underestimated since Facebook and Tik Tok are the only Global CAPs that we consider for the category “social networks” (Instagram and LinkedIn for instance are not included due to lack of data) so that our approach is conservative.

<sup>66</sup> Amazon Prime is considered to be a video app in the Sandvine Report hence Amazon Prime means Prime Video.

<sup>67</sup> Sandvine, The Global internet phenomena report, January 2023.

<sup>68</sup> 13.74% + 10.51% + 4.2% + 2.67% = 31.12%.

<sup>69</sup> Sandvine’s data indicate that video represents 66% of total traffic. This number includes traffic of TikTok and Facebook Video. As these apps are included in our category “social networks”, we exclude them from “Video” and include them in “Social Networking”. We obtain that video represents 60% (= 66% - 3.55% - 1.98%) and social networks represent 11% (= 5% + 3.55% + 1.98%) of total traffic.

<sup>70</sup> 31% / 60% = 52%.

<sup>71</sup> Exact quote from Sandvine, The Global internet phenomena report p.14, January 2023: “Video includes TV, video, and streaming download [...]”.

<sup>72</sup> Sandvine’s data indicate that video represents 66% of total traffic. This number includes the traffic of TikTok and Facebook Video. As these apps are included in our category “social networks”, we exclude them from “Video” and include them in “Social Networking”. We obtain that video represents 60% (= 66% - 3.55% - 1.98%) and that social networks represent 11% (= 5% + 3.55% + 1.98%) of total traffic.

<sup>73</sup> 8% / 11% = 77%.

**Service type: online gaming**

The share of Global CAPs in the “online gaming” category is calculated by dividing the share of Xbox Live (Microsoft) in total traffic, which amounts to 2.71%, by the share of online gaming in total traffic, which amounts to 5.6%. We obtain that Global CAPs represent 49%<sup>74</sup> of the traffic of the “online gaming” category. Note that Xbox is not the only Large CAP in online gaming. For instance, Amazon owns Amazon Luna, a cloud gaming service, and Meta owns Meta Quest. Additionally, Nintendo is not identified in Sandvine’s data, even though it is presumably a key player in online gaming.

**Summary: shares of Global CAPs**

Table 8 summarizes the shares of traffic of Global CAPs in each category.

Table 8

**Share of Global CAPs in the value of broadband services, by category**

	Share of Global CAPs
Video streaming and sharing	52%
Social networks	77%
Online gaming	49%

Source: Deloitte Finance

**Estimating the value attributed to accessing services of Global CAPs**

The shares of the broadband subscription price that Internet users attribute to accessing services of Global CAPs by category are calculated by multiplying the shares of the broadband subscription price that Internet users attribute to accessing services of each category of services by the shares of Global CAPs in each category (see Table 8). Then, the shares are summed to obtain the share of the broadband subscription price attributed by Internet users to accessing the services of Global CAPs.

To compute the value that Internet users attribute to accessing services provided by Global CAPs, the share of the broadband subscription price that Internet users attribute to accessing services of Global CAPs is multiplied by the average price of the subscription. Like previously, the lower range corresponds to the value obtained using the prices decreased by 25% and the upper range corresponds to the value obtained using the prices increased by 25%.

The computations performed to calculate the value attributed by Internet users to accessing services of large CAPs and Global CAPs are presented in the following table. To ease the reading, the figures are presented only for the “social networks” category and for France. The same calculations are performed for all countries and for the categories of services “video streaming and sharing” and “online gaming”.

To obtain values comparable to the network costs estimated in the FE study, we first exclude VAT, and we then multiply the result by 12 to convert a monthly value into a yearly value.

Table 9

**Illustration of the methodology: social media in the French market**

		Fixed broadband	Mobile broadband
Willingness to pay for accessing social networks (obtained from the survey - in €/month/customer)	(1)	15	17
Share of category social networks in total willingness to pay (obtained from the survey)	(2)	21%	37%
Broadband price (obtained from the survey - in €/month/customer)*	(3)	[26 - 43]	[14 - 23]
Value attributed by Internet users to accessing social networks provided by all CAPs (in €/month/customer)**	(4) = (2) * (3)	[5 - 9]	[5 - 8]
Share of Global CAPs in social networks computed with Sandvine’s data	(5)	77%	77%
Value attributed by Internet users to accessing social networks services provided by Global CAPs (in €/month/customer)	(6) = (4) * (5)	[4 - 7]	[4 - 7]

\*The interval is due to the fact that in order to build some sensitivity in our results, we derive a range of prices, with the lower and upper range value corresponding to the average broadband price in the country decreased and increased, respectively, by 25%.

\*\*We assume that the share of the category in the total willingness to pay is equal to the share of the category in broadband subscription price.

Source: Deloitte Finance

<sup>74</sup> 2.71% / 5.58% = 49%.



# 4. Generalization to Europe and results

In the previous sections we described the approach to estimating the value attributed by Internet users to accessing services provided by large CAPs in France, Germany, Italy, and Spain. In this section, we present the methodology used to generalize our results to the European level and the results obtained.

Note that we include the 27 countries of the European Union and the United Kingdom to have the same perimeter as the FE study. Our approach consists of first extrapolating the values obtained to the European level (section 4.1) and then compare the values obtained with the network costs estimated by the FE study (section 4.2).

## 4.1 Generalization of the results to Europe

In this section, we describe the approach used to estimate the value attributed by Internet users to accessing services provided by large CAPs in Europe (EU27 + UK) per year. All calculations are performed for large CAPs on the one hand and Global CAPs on the other hand.

We first calculate a weighted average of the values attributed by Internet users to accessing the services provided by large CAPs estimated in the four countries surveyed. The weights used are the numbers of subscribers of fixed broadband and mobile broadband in each country, obtained from ITU data (see Table 10).<sup>75</sup>



Table 10  
Number of subscribers in 2021, by country

Number of subscribers (in million)	France	Germany	Italy	Spain
<b>Fixed broadband<sup>76</sup></b>	31	37	19	17
<b>Mobile broadband<sup>77</sup></b>	65	79	57	51

Source: ITU, 2023 (ITU research based on ARCEP, Bundesnetzagentur, AGCOM, CNMC)

To extrapolate these values to Europe, we first consider the broadband price differences between the four countries surveyed and European countries (EU 27 + UK). We obtain price data from ITU<sup>78</sup> to calculate the ratio between the weighted average price in Europe (EU 27+UK) and the weighted average price from our study.<sup>79</sup>

We adjust the valuations per subscriber obtained from our consumer survey by

the ratio of prices (ITU Europe 27 countries and UK / ITU 4 countries) to estimate a representative number for Europe.

We multiply this number by the number of subscribers considered in the FE study to obtain the total annual value that Internet users attribute in Europe to accessing services provided by large CAPs. The results are presented in the following table.

<sup>75</sup> ITU indicators: *Fixed-broadband subscriptions* for “fixed internet”, *Active mobile-broadband subscriptions* for “mobile internet”.

<sup>76</sup> Indicator definition according to the ITU: “Fixed-broadband subscriptions refers to fixed subscriptions to high-speed access to the public Internet (a TCP/IP connection); at downstream speeds equal to; or greater than; 256 kbit/s. This includes cable modem; DSL; fibre-to-the-home/building; other fixed (wired)-broadband subscriptions; satellite broadband and terrestrial fixed wireless broadband. This total is measured irrespective of the method of payment. It excludes subscriptions that have access to data communications (including the Internet) via mobile-cellular networks. It should include fixed WiMAX and any other fixed wireless technologies. It includes both residential subscriptions and subscriptions for organizations.”

<sup>77</sup> Indicator definition according to the ITU: “Active mobile-broadband subscriptions” refers to the sum of standard mobile-broadband and dedicated mobile-broadband subscriptions to the public Internet. It covers actual subscribers; not potential subscribers; even though the latter may have broadband enabled-handsets.”

<sup>78</sup> ICT Price 2022, ITU. Prices for fixed internet are derived from the “fixed broadband basket”. Prices for mobile are derived from the “mobile data and voice high consumption basket” (140 min, 2Go). Source: Deloitte

<sup>79</sup> Data from ITU, for the last available year 2021. For number of subscribers to mobile internet we used the variable “i271mw Active mobile-broadband subscriptions”. For fixed internet, we used “i4213TFBB Fixed-broadband subscriptions”.

Table 11

**Value attributed by Internet users to accessing services provided by large CAPs (€ per year) – Europe**

	All large CAPs		Global CAPs only	
	Fixed broadband	Fixed broadband	Fixed broadband	Fixed broadband
<b>Value to access large CAPs (in bn € per year)</b>	€ [32 – 53] bn	€ [55 – 91] bn	€ [19 – 32] bn	€ [34 – 57] bn

Source: Deloitte Finance

The total values that Internet users attribute to accessing services provided by large CAPs in Europe and per year range between €32bn and €53bn for fixed broadband and €55bn and €91bn for mobile broadband.

When considering only access to services provided by Global CAPs, the total values that Internet users attribute to accessing these services range between €19bn and €32bn for fixed broadband and €34bn and €57bn for mobile broadband.

**4.2 Comparison of the results with the network costs of the FE study**

The values that Internet users attribute to accessing services provided by large CAPs are finally compared to the network costs attributable to all OTT traffic estimated in the FE study.<sup>80</sup>

It is important to emphasize that our results only concern the values attributed to accessing the services of large CAPs (which provide video streaming and sharing services, social networks services or online gaming services) and not to all CAPs, which we understand would be the valid reference point as the FE study evaluates the costs relating to all “OTT traffic”, not to the subset of OTT traffic relating to video streaming and sharing, social networks and online gaming. This means that our comparison underestimates the value attributed by Internet users to all the services that are used to determine all OTT traffic network costs and is therefore a conservative comparison.

In this report we do not evaluate or study the methodology used by FE to estimate all OTT costs. The results of the FE study are

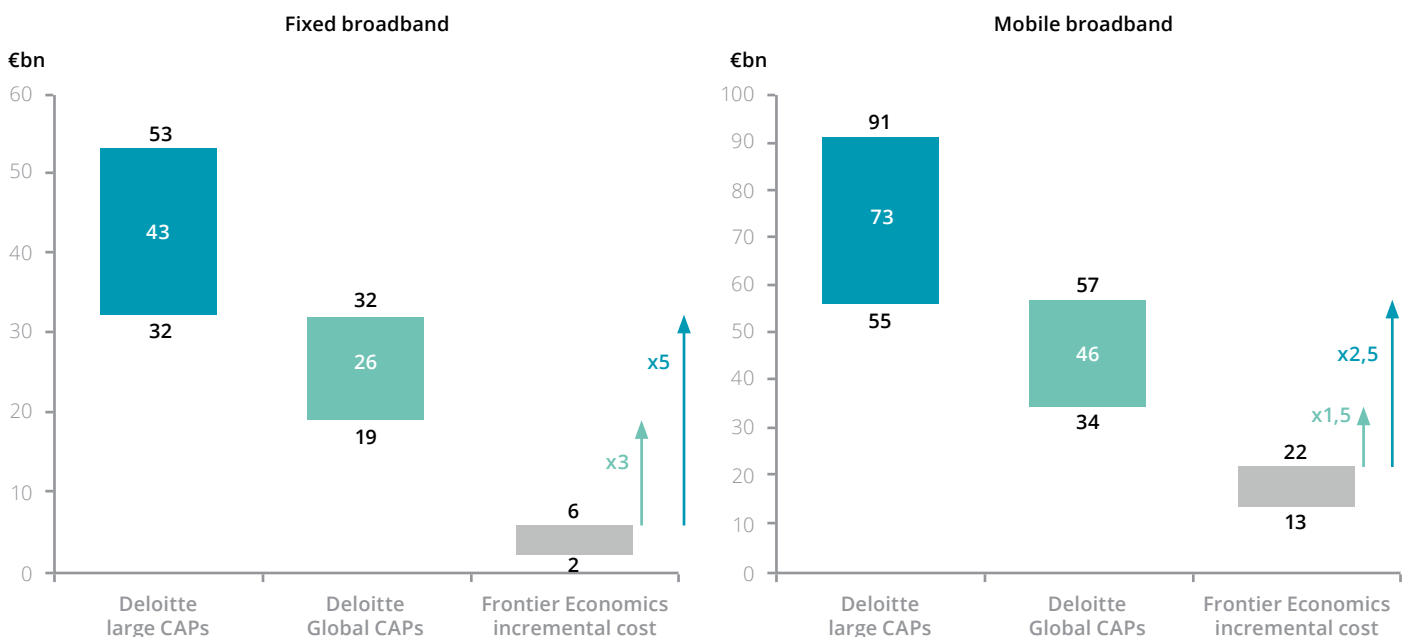
used solely as a point of comparison since the study is prominently referenced in the debate and has been used in particular by ISPs.

In the comparison below, we consider both the incremental costs and total costs estimated in the FE study. However, in line with the views expressed by other commentators, we consider that only incremental costs could be considered attributable to the traffic of OTTs, not total costs.

The following figures compare the values that Internet users attribute to accessing services provided by large CAPs and Global CAPs (obtained in Table 11) with the network costs of the FE study at EU27+UK level. Figure 5 focuses on incremental costs, while Figure 6 focuses on total costs.

Figure 5

**Comparison of the values that Internet users attribute to accessing services of large CAPs with the incremental network costs of the Frontier Economics study, total per year**

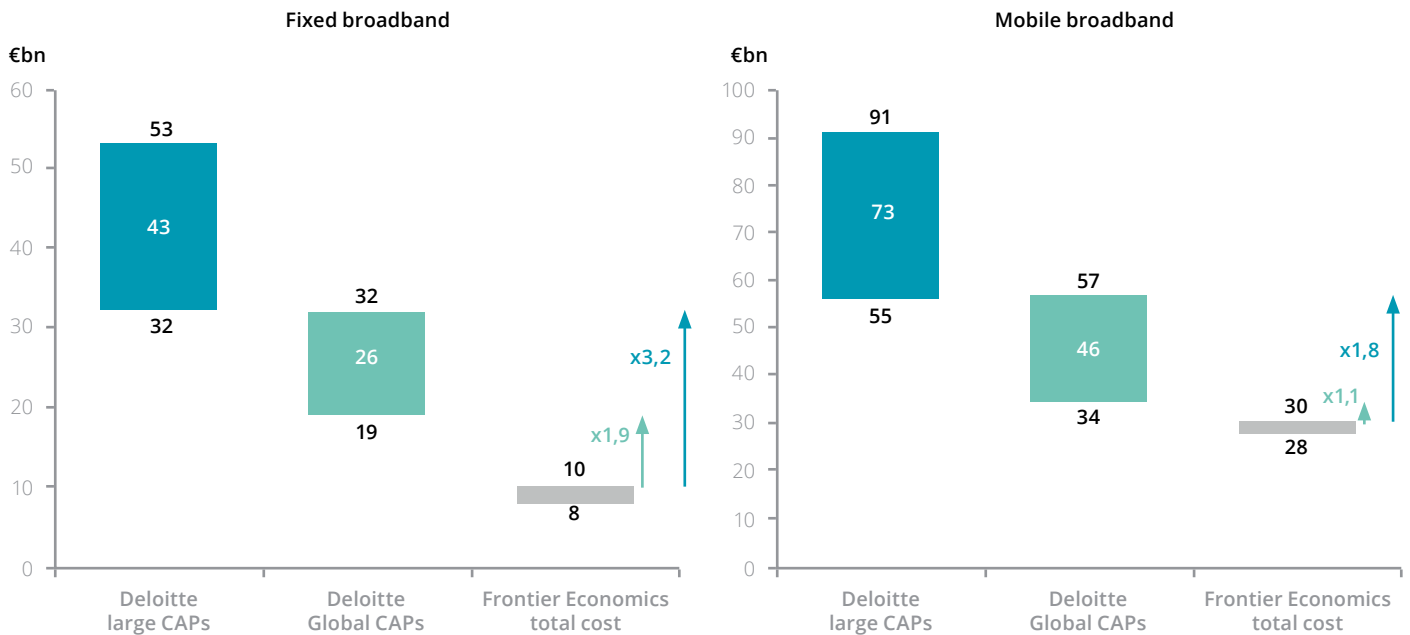


Source: Deloitte Finance, Frontier Economics

<sup>80</sup> Frontier Economics, Estimating OTT traffic-related costs on European telecommunications networks, April 7, 2022.

Figure 6

**Comparison of the values that Internet users attribute to accessing services of large CAPs with the total network costs of the Frontier Economics study, total per year**



Source: Deloitte Finance, Frontier Economics

For fixed broadband, the value that Internet users attribute to accessing the services of large CAPs in Europe ranges between €32bn and €53bn per year. When we focus only on Global CAPs, the value ranges between €19bn and €32bn per year. For mobile broadband, the value that Internet users attribute to accessing the services of large CAPs in Europe ranges between €55bn and €91bn per year. When we focus only on Global CAPs, the value ranges between €34bn and €57bn per year.

As shown in Figure 5, the value attributed by European Internet users to accessing services provided by large CAPs is at least five times the incremental costs of all OTTs' fixed network traffic (estimated by FE at between €2-6bn) and more than twice that of mobile network traffic (€13-22bn).

As shown in Figure 6, the value attributed by European Internet users to accessing services provided by large CAPs is more than three times the total costs of all OTTs' fixed network traffic (estimated by FE at between €8-10bn) and nearly twice that of mobile network traffic (€28-30bn).

Even when limiting the analysis only to Global CAPs, European Internet users attribute an annual value to accessing their services ranging between €19-32bn for fixed broadband and €34-57bn for mobile broadband, well more than the costs attributed to all OTTs in the FE study.

Thus, whatever the scenario considered, the value attributed by Internet users to accessing the services provided by large CAPs across Europe, and even by Global CAPs, always exceed the costs attributed by FE to all OTT traffic on both fixed and mobile networks.







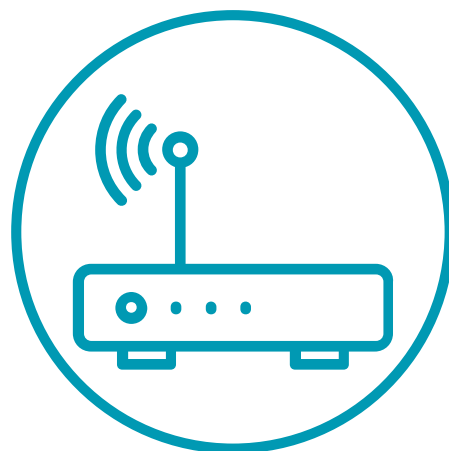
# 5. Conclusion

The aim of this study is to understand the value that Internet users place on the content and applications they can access with their fixed and mobile broadband subscriptions. For this, together with the French polling and market research firm IFOP, we surveyed representative consumers in four countries: France, Germany, Spain, and Italy in 2023.

We analyze the surveys using a choice-based conjoint analysis methodology to estimate consumers' willingness to pay for accessing certain categories of services offered by CAPs. We focus first on three data-intensive services, namely, video streaming and sharing, social networks and online gaming, to estimate the value attributed by Internet users to accessing these categories of services. We refer to content and applications providers (CAPs) offering these three types of services as large CAPs. We then also assess the value consumers attribute to a subset of large CAPs with global presence, which we refer to as Global CAPs.

We estimate that the annual value attributed by European Internet users to accessing services provided by large CAPs ranges between €32bn and €53bn for fixed broadband and between €55bn and €91bn for mobile broadband. Therefore, we conclude that the value attributed by European Internet users to accessing services provided by large CAPs exceeds by at least five times the incremental costs (€2-6bn) that FE associated with the traffic of all OTTs on fixed broadband networks in Europe, and by nearly two times the incremental costs on mobile networks (€13-22bn).

Even when limiting our analysis to the subset of Global CAPs, we estimate that the value that European Internet users attribute to accessing these subsets of services, ranging between €19-32bn for fixed broadband and €34-57bn for mobile broadband, are well more than the costs attributed to all CAPs in the FE study.



# Appendix 1: Fixed Internet survey

## Study "Uses of internet"

*INTERROGATION OF 1000 INHABITANTS aged 18, and more, representative of the French population. 500 respondents for the fixed internet questionnaire and 500 respondents for the mobile questionnaire*

### SCREENING & PROFILING

**Do you work, or someone close to you works, in any of the following sectors?**

*SEVERAL POSSIBLE ANSWERS – ROTATIONS OF ITEMS EXCEPT CODE 99*

Hygiene Beauty	1	
Advertising or marketing	2	→ STOP INTERVIEW
Delivery of parcels or mail	3	
Market research	4	→ STOP INTERVIEW
Mass retail	5	
Health	6	
Telecom operator	7	→ STOP INTERVIEW
Automotive industry	8	
Media and entertainment	9	→ STOP INTERVIEW
None of these sectors	99	

**RCS What is your gender?**

*ONLY ONE POSSIBLE ANSWER - QUOTAS*

A man	1
A woman	2

**SC3 How old are you?**      /\_\_/\_/Years old

**SC4 Recode Age**

*NOT VISIBLE TO RESPONDENTS - QUOTAS*

Under 18	1	➔ <i>STOP INTERVIEW</i>
18-24 years	2	
25-34 years	3	
35-49 years	4	
50-64 years	5	
65 years and older	6	

**SC5a What is your profession?**

**If you are currently unemployed, please indicate your previous activity.**

*ONLY ONE POSSIBLE ANSWER*

Farmer	1	➔ <i>Socio-economic classification A</i>
Craftsman/Craftswoman, shopkeeper, entrepreneur	2	
Liberal profession, executive and higher intellectual profession	3	
Intermediate occupation, technician, foreman/forewoman, supervisor	4	➔ <i>Socio-economic classification B</i>
Employee	5	
Worker	6	➔ <i>Socio-economic classification C</i>
Retired	7	
Other inactive (pupil, student)	8	➔ <i>Socio-economic classification D</i>

**SC5b Are you the person with the highest income in your household?**

*ONLY ONE POSSIBLE ANSWER*

Yes	1	➔ <i>GO TO SC6</i>
No	2	➔ <i>INSTALL SC5C</i>

**SC5c What is the occupation of the person with the highest income in your household?**

**If he/she is currently unemployed, please indicate his/her former activity.**

*ONLY ONE POSSIBLE ANSWER*

Farmer	1	➡ Socio-economic classification A
Craftsman/Craftswoman, shopkeeper, entrepreneur	2	
Liberal profession, executive and higher intellectual profession	3	
Intermediate occupation, technician, foreman/forewoman, supervisor	4	➡ Socio-economic classification B
Employee	5	
Worker	6	➡ Socio-economic classification C
Retired	7	➡ Socio-economic classification D
Other inactive (pupil, student)	8	

**SC6 Including yourself, how many people are in your household?**

ONLY ONE POSSIBLE ANSWER

1 person	1
2 people	2
3 people	3
4 or more people	4

INSTALL SC7 TO HOUSEHOLDS OF 2 PEOPLE OR MORE (CODES 2 TO 4 IN SC6)

**SC7 How many children under the age of 18 are there in your household?**

ONLY ONE POSSIBLE ANSWER

None	1
1 child	2
2 or more children	3

**SC8 What is your place of residence postal code?**

/ \_ / \_ / \_ / \_ / \_

**SC9 Region Recode**

PAGE NOT VISIBLE TO RESPONDENTS

Paris region	1
Northwest	2
Northeast	3
Southwest	4
South East	5

**SC10 Agglomeration size (information panel)**

PAGE NOT VISIBLE TO RESPONDENTS

CC1: Rural communes	1
CC2: Urban agglomeration of less than 20,000 inhabitants	2
CC3: Urban agglomeration of 20,000 to 100,000 inhabitants	3
CC4: Urban agglomeration of 100,000 inhabitants and more	4
CC5: Paris agglomeration	5

**INFORMATION ON THE USES OF INTERNET**

TO ALL

**L1 Do you have a fixed internet connection (ADSL, cable or fiber subscription) at home and/or a mobile internet connection (high speed mobile internet connection, 4G/5G)?**

*ONLY ONE POSSIBLE ANSWER PER ITEM – ROTATION OF ITEMS*

		Yes	No
1	<b>A fixed internet connection at home</b>	1	2
2	<b>A mobile internet connection</b>	1	2

➔ IF NONE **CODES 1 TO L1.1 AND L1.2: END OF INTERVIEWS (DATA ARE KEPT)**

➔ Respondents will be presented with either the Fixed Internet Connection Questionnaire or the Mobile Internet Connection Questionnaire. The allocation mechanism will ensure that 800 responses from each questionnaire are collected.

➔ IF CODE L1.1 = 1 & CODE L1.2 = 1: RANDOM ALLOCATION OF THE QUESTIONNAIRE ON THE FIXED CONNECTION OR MOBILE CONNECTION (TO OBTAIN 800 ANSWERS FOR EACH QUESTIONNAIRE), IF L1.1 = 1 & L1.2 = 2: QUESTIONNAIRE ON THE FIXED CONNECTION, IF L1.1 = 2 & L1.2 = 1: QUESTIONNAIRE ON THE MOBILE CONNECTION

**QUESTIONNAIRE ON THE FIXED INTERNET CONNECTION**

*THIS QUESTIONNAIRE IS ABOUT HOW YOU USE YOUR **FIXED INTERNET CONNECTION** (CONNECTION AT HOME WITH FIXED OR MOBILE DEVICE). PLEASE EXCLUDE EVERYTHING THAT IS PERFORMED WITH A MOBILE CONNECTION.*

**F1** You told us you have a fixed internet connection at your home. How much does your **fixed internet package** cost you **every month** (indicate the total price of the subscription without cents)?

€ / \_\_/ \_\_/ \_\_/ per month

You don't know at all

**F2** Within your household, are you the person who chose, or who pays, this fixed internet subscription?

*ONLY ONE ANSWER POSSIBLE*

YES	1
NO	2

**F3** In addition to internet access, which other services do you have in the fixed internet package you chose?

*MULTIPLE ANSWERS POSSIBLE – ITEM ROTATION*

Television by a decoder (TV box)	5.1	1
Fixed telephony	5.2	2
Mobile phone plan	5.3	3
Subscription to streaming music	5.4	4
Pay TV Channels	5.5	5
SVOD services	5.6	6
Other services	5.7	7
<i>No additional services</i>	5.8	8

**F4** How many people (including you) use the internet through your **fixed internet package** at your home?

/ \_\_/ persons

(Consistency with the number of people in the household in SC6)

**F5 How often do you, and others who use your internet connection (for example your children), access the following services with your fixed internet connection?**

*MULTIPLE ANSWERS POSSIBLE – ITEM ROTATION*

		Several times a day	Once a day	Several times a week	Once a week or less	Once a month or less	Never
1	Working or training, including videoconferencing	1	2	3	4	5	6
2	Social networks (Facebook, Instagram, Tiktok, etc.)	1	2	3	4	5	6
3	Movies and audio-visual contents (Netflix, Disney+, Amazon Prime Video, AV-Streaming-Services of Public Broadcasters, etc.)	1	2	3	4	5	6
4	Videos watching (YouTube, Vimeo, etc.)	1	2	3	4	5	6
5	Online gaming (PC, Playstation, Xbox live, etc.)	1	2	3	4	5	6
6	Reading emails and news, banking operations, searching on a search engine, etc.	1	2	3	4	5	6
7	Online shopping	1	2	3	4	5	6
8	Video calls with friends and family	1	2	3	4	5	6
9	Streaming music (Spotify, etc.)	1	2	3	4	5	6
10	Downloading files (movies, series, games, etc.)	1	2	3	4	5	6
11	<i>Others</i>	1	2	3	4	5	6

**F6 In general, when do you, and others who use your internet connection (for example your children), do the following tasks with your fixed internet connection?**

*MULTIPLE ANSWERS POSSIBLE – ITEM ROTATION*

		During the day	In the evening	During the night	At any time of the day (day, evening and night)	Never
1	Working or training, including videoconferencing	1	2	3	4	5
2	Social networks (Facebook, Instagram, Tiktok, etc.)	1	2	3	4	5
3	Movies and audio-visual contents (Netflix, Disney+, Amazon Prime Video, AV-Streaming-Services of Public Broadcasters, etc.)	1	2	3	4	5
4	Videos watching (YouTube, Vimeo, etc.)	1	2	3	4	5
5	Online gaming (PC, Playstation, Xbox live, etc.)	1	2	3	4	5
6	Reading emails and news, banking operations, searching on a search engine, etc.	1	2	3	4	5
7	Online shopping	1	2	3	4	5
8	Video calls with friends and family	1	2	3	4	5
9	Streaming music (Spotify, etc.)	1	2	3	4	5
10	Downloading files (movies, series, games, etc.)	1	2	3	4	5
11	<i>Others</i>	1	2	3	4	5



Imagine a fictitious situation in which you must choose a new fixed internet access subscription. In each of the following questions, you will have the opportunity to choose between two options for the subscription.

Each subscription is characterized by:

- A monthly price
- The ability to access basic internet services, meaning browsing the web, reading and answering to emails, making calls, shopping online, making videoconferences, etc.
- The ability to have a full access to the services, meaning **video platforms** (e.g. on YouTube, Netflix, Prime Video, Disney+, etc.), **social networks** (e.g. Facebook, Instagram, TikTok, etc.), **online games** (e.g. Xbox Live, PlayStation Plus, etc.), or **streaming live TV** (e.g. live streamed TV channel)
- The time of day during which these services can be accessed

The other characteristics of the subscriptions are the same between the two subscriptions offered (operator, connection technology, number of repeaters, number of TV channels, type of box (design, storage, etc.), sound and image quality, telephony, commitment time, download speed, connection reliability, etc.)

Note we only speak about the ability to access the services and not subscriptions to them (for example the subscription price does not include Netflix, Amazon Prime Video...)

Take the time to read the questions carefully and try to answer as best you can! 😊

**F7 to F14, 4 VERSIONS: RANDOM ATTRIBUTION TO RESPONDENTS TO HAVE THE SAME NUMBER OF RESPONDENTS IN EACH 4 SUBGROUP.**

**VERSION 1**

**F7 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

*ONLY ONE POSSIBLE ANSWER – ITEM ROTATION*

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Not in the evening	At all times
Access to social networks (TikTok, Facebook, etc.)	Not in the evening	At all times
Access to online gaming (PlayStation Plus, etc.)	Never	At all times
Access to streaming live TV and sport	Not in the evening	At all times
Price	€30 / month	€40 / month

**F8 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

*ONLY ONE POSSIBLE ANSWER – ITEM ROTATION*

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Not in the evening	Never
Access to social networks (TikTok, Facebook, etc.)	Not in the evening	At all times
Access to online gaming (PlayStation Plus, etc.)	Never	Not in the evening
Access to streaming live TV and sport	At all times	Never
Price	€30 / month	€15 / month

**F9 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	At all times	Never
Access to social networks (TikTok, Facebook, etc.)	At all times	Never
Access to online gaming (PlayStation Plus, etc.)	Not in the evening	At all times
Access to streaming live TV and sport	Not in the evening	Never
Price	€30 / month	€55 / month

**F10 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Not in the evening	At all times
Access to social networks (TikTok, Facebook, etc.)	Never	Not in the evening
Access to online gaming (PlayStation Plus, etc.)	Not in the evening	At all times
Access to streaming live TV and sport	Never	At all times
Price	€40 / month	€55 / month

**F11 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	At all times	Not in the evening
Access to social networks (TikTok, Facebook, etc.)	At all times	Never
Access to online gaming (PlayStation Plus, etc.)	Never	Not in the evening
Access to streaming live TV and sport	Not in the evening	At all times
Price	€15 / month	€30 / month

**F12 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Never	Not in the evening
Access to social networks (TikTok, Facebook, etc.)	At all times	Not in the evening
Access to online gaming (PlayStation Plus, etc.)	Not in the evening	Never
Access to streaming live TV and sport	At all times	Not in the evening
Price	€30 / month	€15 / month

**F13 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Never	At all times
Access to social networks (TikTok, Facebook, etc.)	At all times	Never
Access to online gaming (PlayStation Plus, etc.)	At all times	Not in the evening
Access to streaming live TV and sport	Never	At all times
Price	€40 / month	€15 / month

**F14 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

*ONLY ONE POSSIBLE ANSWER*

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Never	Not in the evening
Access to social networks (TikTok, Facebook, etc.)	Never	Not in the evening
Access to online gaming (PlayStation Plus, etc.)	At all times	Not in the evening
Access to streaming live TV and sport	Not in the evening	At all times
Price	€55 / month	€40 / month

**VERSION 2**

**F7 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

*ONLY ONE POSSIBLE ANSWER – ITEM ROTATION*

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	At all times	Never
Access to social networks (TikTok, Facebook, etc.)	Never	Not in the evening
Access to online gaming (PlayStation Plus, etc.)	Never	At all times
Access to streaming live TV and sport	Never	At all times
Price	€55 / month	€40 / month

**F8 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

*ONLY ONE POSSIBLE ANSWER – ITEM ROTATION*

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Not in the evening	At all times
Access to social networks (TikTok, Facebook, etc.)	At all times	Never
Access to online gaming (PlayStation Plus, etc.)	Not in the evening	Never

Access to streaming live TV and sport	Never	At all times
Price	€55 / month	€40 / month

**F9 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Not in the evening	Never
Access to social networks (TikTok, Facebook, etc.)	Not in the evening	Never
Access to online gaming (PlayStation Plus, etc.)	Never	Not in the evening
Access to streaming live TV and sport	Never	Not in the evening
Price	€15 / month	€30 / month

**F10 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	At all times	Not in the evening
Access to social networks (TikTok, Facebook, etc.)	Never	Not in the evening
Access to online gaming (PlayStation Plus, etc.)	At all times	Not in the evening
Access to streaming live TV and sport	Not in the evening	At all times
Price	€30 / month	€40 / month

**F11 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Never	At all times
Access to social networks (TikTok, Facebook, etc.)	Not in the evening	At all times
Access to online gaming (PlayStation Plus, etc.)	At all times	Not in the evening

Access to streaming live TV and sport	Not in the evening	At all times
Price	€30 / month	€55 / month

**F12 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

*ONLY ONE POSSIBLE ANSWER*

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	At all times	Never
Access to social networks (TikTok, Facebook, etc.)	At all times	Not in the evening
Access to online gaming (PlayStation Plus, etc.)	Not in the evening	Never
Access to streaming live TV and sport	Not in the evening	Never
Price	€40 / month	€30 / month

**F13 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

*ONLY ONE POSSIBLE ANSWER*

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Not in the evening	Never
Access to social networks (TikTok, Facebook, etc.)	Never	At all times
Access to online gaming (PlayStation Plus, etc.)	At all times	Never
Access to streaming live TV and sport	Never	Not in the evening
Price	€55 / month	€30 / month

**F14 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

*ONLY ONE POSSIBLE ANSWER*

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Not in the evening	Never

Access to social networks (TikTok, Facebook, etc.)	Never	Not in the evening
Access to online gaming (PlayStation Plus, etc.)	At all times	Not in the evening
Access to streaming live TV and sport	At all times	Never
Price	€30 / month	€55 / month

### VERSION 3

**F7 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

*ONLY ONE POSSIBLE ANSWER – ITEM ROTATION*

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	At all times	Never
Access to social networks (TikTok, Facebook, etc.)	At all times	Never
Access to online gaming (PlayStation Plus, etc.)	At all times	Not in the evening
Access to streaming live TV and sport	Not in the evening	Never
Price	€55 / month	€15 / month

**F8 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

*ONLY ONE POSSIBLE ANSWER – ITEM ROTATION*

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Not in the evening	At all times
Access to social networks (TikTok, Facebook, etc.)	Not in the evening	At all times
Access to online gaming (PlayStation Plus, etc.)	At all times	Never
Access to streaming live TV and sport	Not in the evening	Never
Price	€55 / month	€15 / month

**F9 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

*ONLY ONE POSSIBLE ANSWER*

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Not in the evening	Never
Access to social networks (TikTok, Facebook, etc.)	Never	Not in the evening
Access to online gaming (PlayStation Plus, etc.)	Not in the evening	Never
Access to streaming live TV and sport	Never	At all times
Price	€30 / month	€15 / month

**F10 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**  
*ONLY ONE POSSIBLE ANSWER*

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	At all times	Never
Access to social networks (TikTok, Facebook, etc.)	Not in the evening	At all times
Access to online gaming (PlayStation Plus, etc.)	Not in the evening	Never
Access to streaming live TV and sport	At all times	Never
Price	€15 / month	€40 / month

**F11 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**  
*ONLY ONE POSSIBLE ANSWER*

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	At all times	Not in the evening
Access to social networks (TikTok, Facebook, etc.)	Not in the evening	At all times
Access to online gaming (PlayStation Plus, etc.)	Not in the evening	At all times
Access to streaming live TV and sport	Never	At all times
Price	€40 / month	€15 / month

**F12 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**



*ONLY ONE POSSIBLE ANSWER*

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Never	Not in the evening
Access to social networks (TikTok, Facebook, etc.)	Not in the evening	Never
Access to online gaming (PlayStation Plus, etc.)	Not in the evening	Never
Access to streaming live TV and sport	Not in the evening	At all times
Price	€30 / month	€55 / month

**F13 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

*ONLY ONE POSSIBLE ANSWER*

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Not in the evening	At all times
Access to social networks (TikTok, Facebook, etc.)	At all times	Never
Access to online gaming (PlayStation Plus, etc.)	At all times	Never
Access to streaming live TV and sport	Not in the evening	Never
Price	€40 / month	€30 / month

**F14 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

*ONLY ONE POSSIBLE ANSWER*

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Never	Not in the evening
Access to social networks (TikTok, Facebook, etc.)	Not in the evening	Never
Access to online gaming (PlayStation Plus, etc.)	Not in the evening	Never
Access to streaming live TV and sport	At all times	Not in the evening

Price

€55 / month

€40 / month

**VERSION 4**

**F7 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

*ONLY ONE POSSIBLE ANSWER – ITEM ROTATION*

Access to basic services (mails, browser, calls, etc.)

At all times

At all times

Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)

Never

At all times

Access to social networks (TikTok, Facebook, etc.)

Not in the evening

At all times

Access to online gaming (PlayStation Plus, etc.)

Not in the evening

At all times

Access to streaming live TV and sport

Not in the evening

Never

Price

€15 / month

€30 / month

**F8 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

*ONLY ONE POSSIBLE ANSWER – ITEM ROTATION*

Access to basic services (mails, browser, calls, etc.)

At all times

At all times

Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)

Not in the evening

Never

Access to social networks (TikTok, Facebook, etc.)

At all times

Never

Access to online gaming (PlayStation Plus, etc.)

Never

At all times

Access to streaming live TV and sport

Not in the evening

At all times

Price

€55 / month

€15 / month

**F9 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

*ONLY ONE POSSIBLE ANSWER*

Access to basic services (mails, browser, calls, etc.)

At all times

At all times

Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)

At all times

Never

Access to social networks (TikTok, Facebook, etc.)	Not in the evening	At all times
Access to online gaming (PlayStation Plus, etc.)	At all times	Never
Access to streaming live TV and sport	Never	At all times
Price	€15 / month	€55 / month

**F10 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

*ONLY ONE POSSIBLE ANSWER*

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	At all times	Never
Access to social networks (TikTok, Facebook, etc.)	Not in the evening	At all times
Access to online gaming (PlayStation Plus, etc.)	Not in the evening	At all times
Access to streaming live TV and sport	Not in the evening	At all times
Price	€55 / month	€15 / month

**F11 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

*ONLY ONE POSSIBLE ANSWER*

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Never	Not in the evening
Access to social networks (TikTok, Facebook, etc.)	Never	At all times
Access to online gaming (PlayStation Plus, etc.)	Never	At all times
Access to streaming live TV and sport	At all times	Never
Price	€40 / month	€15 / month

**F12 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

*ONLY ONE POSSIBLE ANSWER*

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	At all times	Not in the evening

Access to social networks (TikTok, Facebook, etc.)	Never	At all times
Access to online gaming (PlayStation Plus, etc.)	At all times	Never
Access to streaming live TV and sport	Not in the evening	At all times
Price	€40 / month	€30 / month

**F13 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

*ONLY ONE POSSIBLE ANSWER*

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	At all times	Never
Access to social networks (TikTok, Facebook, etc.)	Not in the evening	Never
Access to online gaming (PlayStation Plus, etc.)	At all times	Never
Access to streaming live TV and sport	Never	Not in the evening
Price	€30 / month	€55 / month

**F14 Imagine you have to choose a new subscription for your fixed internet access. Which of two following packages would you choose?**

*ONLY ONE POSSIBLE ANSWER*

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	At all times	Not in the evening
Access to social networks (TikTok, Facebook, etc.)	Not in the evening	Never
Access to online gaming (PlayStation Plus, etc.)	Never	Not in the evening
Access to streaming live TV and sport	Never	Not in the evening
Price	€40 / month	€15 / month

**IF F1 DIFFERENT FROM I DON'T KNOW**

**F15** You have indicated that you pay your internet subscription €XX [= answer F1] per month. How much would you be willing to pay at most for the same subscription without access to the following content services: video streaming and sharing, online live TV and sport, social networks and online gaming?

ONLY ONE POSSIBLE ANSWER

- 91 - 100 % of current price (meaning € [= 91%\*answer F1]) to € [= answer F1])
- 81 - 90 % of current price (meaning € [= 81%\*answer F1]) to € [= 90%\*answer F1])
- 71 - 80 % of current price (meaning € [= 71%\*answer F1]) to € [= 80%\*answer F1])
- 61 - 70 % of current price (meaning € [= 61%\*answer F1]) to € [= 70%\*answer F1])
- 51 - 60 % of current price (meaning € [= 51%\*answer F1]) to € [= 60%\*answer F1])
- 41 - 50 % of current price (meaning € [= 41%\*answer F1]) to € [= 50%\*answer F1])
- 31 - 40 % of current price (meaning € [= 31%\*answer F1]) to € [= 40%\*answer F1])
- 21 - 30 % of current price (meaning € [= 21%\*answer F1]) to € [= 30%\*answer F1])
- 11 - 20 % of current price (meaning € [= 11%\*answer F1]) to € [= 20%\*answer F1])
- 0 – 10 % of current price (meaning €0 to € [= 10%\*answer F1])

**IF F1 == I DON'T KNOW**

**F15bis** How much would you be willing to pay at most for your current subscription without access to the following content services: video streaming and sharing, online live TV and sport, social networks and online gaming?

ONLY ONE POSSIBLE ANSWER

- 91 - 100 % of current price
- 81 - 90 % of current price
- 71 - 80 % of current price
- 61 - 70 % of current price
- 51 - 60 % of current price
- 41 - 50 % of current price
- 31 - 40 % of current price
- 21 - 30 % of current price
- 11 - 20 % of current price
- 0 - 10 % of current price

**Thank you for your participation!**

# Appendix 2: Mobile Internet survey

[Include questionnaire]

**Study "Uses of internet"**  
*INTERROGATION OF 1000 INHABITANTS aged 18, and more, representative of the French population. 500 respondents for the fixed internet questionnaire and 500 respondents for the mobile questionnaire*

**SCREENING & PROFILING**

**Do you work, or someone close to you works, in any of the following sectors?**

*SEVERAL POSSIBLE ANSWERS – ROTATIONS OF ITEMS EXCEPT CODE 99*

Hygiene Beauty	1	
Advertising or marketing	2	→ STOP INTERVIEW
Delivery of parcels or mail	3	
Market research	4	→ STOP INTERVIEW
Mass retail	5	
Health	6	
Telecom operator	7	→ STOP INTERVIEW
Automotive industry	8	
Media and entertainment	9	→ STOP INTERVIEW
None of these sectors	99	

**RCS What is your gender?**

*ONLY ONE POSSIBLE ANSWER - QUOTAS*

A man	1
A woman	2

**SC3 How old are you?**      /\_/\_/Years old

**SC4 Recode Age**

NOT VISIBLE TO RESPONDENTS - QUOTAS

Under 18	1	➔ STOP INTERVIEW
18-24 years	2	
25-34 years	3	
35-49 years	4	
50-64 years	5	
65 years and older	6	

**SC5a What is your profession?**

**If you are currently unemployed, please indicate your previous activity.**

ONLY ONE POSSIBLE ANSWER

Farmer	1	➔ Socio-economic classification A
Craftsman/Craftswoman, shopkeeper, entrepreneur	2	
Liberal profession, executive and higher intellectual profession	3	
Intermediate occupation, technician, foreman/forewoman, supervisor	4	➔ Socio-economic classification B
Employee	5	
Worker	6	➔ Socio-economic classification C
Retired	7	
Other inactive (pupil, student)	8	➔ Socio-economic classification D

**SC5b Are you the person with the highest income in your household?**

ONLY ONE POSSIBLE ANSWER

Yes	1	➔ GO TO SC6
No	2	➔ INSTALL SC5C

**SC5c What is the occupation of the person with the highest income in your household?**

**If he/she is currently unemployed, please indicate his/her former activity.**

*ONLY ONE POSSIBLE ANSWER*

Farmer	1	➔ Socio-economic classification A
Craftsman/Craftswoman, shopkeeper, entrepreneur	2	
Liberal profession, executive and higher intellectual profession	3	
Intermediate occupation, technician, foreman/forewoman, supervisor	4	➔ Socio-economic classification B
Employee	5	
Worker	6	➔ Socio-economic classification C
Retired	7	➔ Socio-economic classification D
Other inactive (pupil, student)	8	

**SC6 Including yourself, how many people are in your household?**

*ONLY ONE POSSIBLE ANSWER*

1 person	1
2 people	2
3 people	3
4 or more people	4

*INSTALL SC7 TO HOUSEHOLDS OF 2 PEOPLE OR MORE (CODES 2 TO 4 IN SC6)*

**SC7 How many children under the age of 18 are there in your household?**

*ONLY ONE POSSIBLE ANSWER*

None	1
1 child	2
2 or more children	3

**SC8 What is your place of residence postal code?**

/ \_ / \_ / \_ / \_ / \_

**SC9 Region Recode**

*PAGE NOT VISIBLE TO RESPONDENTS*



Paris region	1
Northwest	2
Northeast	3
Southwest	4
South East	5

**SC10 Agglomeration size (information panel)**

PAGE NOT VISIBLE TO RESPONDENTS

CC1: Rural communes	1
CC2: Urban agglomeration of less than 20,000 inhabitants	2
CC3: Urban agglomeration of 20,000 to 100,000 inhabitants	3
CC4: Urban agglomeration of 100,000 inhabitants and more	4
CC5: Paris agglomeration	5

**INFORMATION ON THE USES OF INTERNET**

TO ALL

**L1 Do you have a fixed internet connection (ADSL, cable or fiber subscription) at home and/or a mobile internet connection (high speed mobile internet connection, 4G/5G)?**

ONLY ONE POSSIBLE ANSWER PER ITEM – ROTATION OF ITEMS

		Yes	No
1	<b>A fixed internet connection at home</b>	1	2
2	<b>A mobile internet connection</b>	1	2

➔ IF NONE **CODES 1 TO L1.1 AND L1.2: END OF INTERVIEWS (DATA ARE KEPT)**

➔ Respondents will be presented with either the Fixed Internet Connection Questionnaire or the Mobile Internet Connection Questionnaire. The allocation mechanism will ensure that 800 responses from each questionnaire are collected.

➔ IF CODE L1.1 = 1 & CODE L1.2 = 1: RANDOM ALLOCATION OF THE QUESTIONNAIRE ON THE FIXED CONNECTION OR MOBILE CONNECTION (TO OBTAIN 800 ANSWERS FOR EACH QUESTIONNAIRE), IF L1.1 = 1 & L1.2 = 2: QUESTIONNAIRE ON THE FIXED CONNECTION, IF L1.1 = 2 & L1.2 = 1: QUESTIONNAIRE ON THE MOBILE CONNECTION

**QUESTIONNAIRE ON THE MOBILE INTERNET CONNECTION**

*THIS QUESTIONNAIRE IS ABOUT HOW YOU USE YOUR MOBILE INTERNET CONNECTION. PLEASE EXCLUDE EVERYTHING THAT IS PERFORMED ON A FIXED INTERNET CONNECTION (CONNECTION AT HOME USED WITH FIXED OR MOBILE DEVICE).*

**M1** You told us you have a mobile internet connection. How much does your mobile plan cost you every month (indicate the total price, without cents, of all the mobile subscriptions that you use regularly)?

€ / \_\_/\_\_/\_\_/\_/ per month

You don't know at all

**M2** Within your household, are you the person who chose, or who pays, this mobile internet plan?

*ONLY ONE ANSWER POSSIBLE*

YES	1
NO	2

**M3** Is your mobile internet connection part of a bundle “internet at home and mobile”?

*ONLY ONE ANSWER POSSIBLE*

YES	1
NO	2

**M4** How often do you, and others who use your mobile internet connection (for example your children), access the following services with your mobile internet connection?

*MULTIPLE ANSWERS POSSIBLE – ITEM ROTATION*

		Several times a day	Once a day	Several times a week	Once a week or less	Once a month or less	Never
1	Working or training, including videoconferencing	1	2	3	4	5	6
2	Social networks (Facebook, Instagram, Tiktok, etc.)	1	2	3	4	5	6
3	Movies and audio-visual contents (Netflix, Disney+, Amazon Prime Video, AV-Streaming-Services of Public Broadcasters, etc.)	1	2	3	4	5	6
4	Videos watching (YouTube, Vimeo, etc.)	1	2	3	4	5	6
5	Online gaming (PC, Playstation, Xbox live, etc.)	1	2	3	4	5	6
6	Reading emails and news, banking operations, searching on a search engine, etc.	1	2	3	4	5	6
7	Online shopping	1	2	3	4	5	6
8	Video calls with friends and family	1	2	3	4	5	6
9	Streaming music (Spotify, etc.)	1	2	3	4	5	6
10	Downloading files (movies, series, games, etc.)	1	2	3	4	5	6
11	<i>Others</i>	1	2	3	4	5	6

**M5 In general, when do you, and others who use your mobile internet connection (for example your children), do the following tasks with your mobile internet connection?**

*MULTIPLE ANSWERS POSSIBLE – ITEM ROTATION*

		During the day	In the evening	During the night	At any time of the day (day, evening and night)	Never
1	Working or training, including videoconferencing	1	2	3	4	5
2	Social networks (Facebook, Instagram, Tiktok, etc.)	1	2	3	4	5
3	Movies and audio-visual contents (Netflix, Disney+, Amazon Prime Video, AV-Streaming-Services of Public Broadcasters, etc.)	1	2	3	4	5
4	Videos watching (YouTube, Vimeo, etc.)	1	2	3	4	5
5	Online gaming (PC, Playstation, Xbox live, etc.)	1	2	3	4	5
6	Reading emails and news, banking operations, searching on a search engine, etc.	1	2	3	4	5
7	Online shopping	1	2	3	4	5
8	Video calls with friends and family	1	2	3	4	5
9	Streaming music (Spotify, etc.)	1	2	3	4	5
10	Downloading files (movies, series, games, etc.)	1	2	3	4	5
11	<i>Others</i>	1	2	3	4	5

Imagine a fictitious situation in which you must choose a new mobile plan. In each of the following questions, you will have the opportunity to choose between two options for the plan.

Each plan is characterized by:

- A monthly price
- The ability to access basic internet services, meaning browsing the web, reading and answering to emails, making calls, shopping online, making videoconferences, etc.
- The ability to have full access to the services, meaning **video platforms** (e.g. on YouTube, Netflix, Prime Video, Disney+, etc.), **social networks** (e.g. Facebook, Instagram, TikTok, etc.), **online games** (e.g. Xbox Live, PlayStation Plus, etc.), or **streaming live TV** (e.g. live streamed TV channel)
- The time of day during which these services can be accessed

The other characteristics of the plans are the same between the two plans offered (operator, connection technology, sound and image quality, speed of connection, amount of voice and SMS, download speed, connection reliability, etc.)

Note we only speak about the ability to access the services and not subscriptions to them (for example the subscription price does not include Netflix, Amazon Prime Video...)

Take the time to read the questions carefully and try to answer as best you can! 😊

M6 to M13, 4 VERSIONS: RANDOM ATTRIBUTION TO RESPONDENTS TO HAVE THE SAME NUMBER OF RESPONDENTS IN EACH 4 SUBGROUP.

### VERSION 1

**M6** Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?

ONLY ONE POSSIBLE ANSWER – ITEM ROTATION

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	At all times	Not in the evening
Access to social networks (TikTok, Facebook, etc.)	At all times	Not in the evening
Access to online gaming (PlayStation Plus, etc.)	At all times	Never
Access to streaming live TV and sport	At all times	Not in the evening
Price	€40 / month	€20 / month

**M7** Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?

ONLY ONE POSSIBLE ANSWER – ITEM ROTATION

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
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Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Not in the evening	Never
Access to social networks (TikTok, Facebook, etc.)	Not in the evening	At all times
Access to online gaming (PlayStation Plus, etc.)	Never	Not in the evening
Access to streaming live TV and sport	At all times	Never
Price	€20 / month	€10 / month

**M8 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	At all times	Never
Access to social networks (TikTok, Facebook, etc.)	At all times	Never
Access to online gaming (PlayStation Plus, etc.)	Not in the evening	At all times
Access to streaming live TV and sport	Not in the evening	Never
Price	€20 / month	€60 / month

**M9 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	At all times	Not in the evening
Access to social networks (TikTok, Facebook, etc.)	Not in the evening	Never
Access to online gaming (PlayStation Plus, etc.)	At all times	Not in the evening
Access to streaming live TV and sport	At all times	Never
Price	€60 / month	€40 / month

**M10 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Not in the evening	At all times
Access to social networks (TikTok, Facebook, etc.)	Never	At all times
Access to online gaming (PlayStation Plus, etc.)	Not in the evening	Never
Access to streaming live TV and sport	At all times	Not in the evening
Price	€20 / month	€10 / month

**M11 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Not in the evening	Never
Access to social networks (TikTok, Facebook, etc.)	Not in the evening	At all times
Access to online gaming (PlayStation Plus, etc.)	Never	Not in the evening
Access to streaming live TV and sport	Not in the evening	At all times
Price	€10 / month	€20 / month

**M12 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	At all times	Never
Access to social networks (TikTok, Facebook, etc.)	Never	At all times
Access to online gaming (PlayStation Plus, etc.)	Not in the evening	At all times
Access to streaming live TV and sport	At all times	Never
Price	€10 / month	€40 / month

**M13 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Never	Not in the evening
Access to social networks (TikTok, Facebook, etc.)	Never	Not in the evening
Access to online gaming (PlayStation Plus, etc.)	At all times	Not in the evening
Access to streaming live TV and sport	Not in the evening	At all times
Price	€60 / month	€40 / month

**VERSION 2**

**M6 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER – ITEM ROTATION

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Never	At all times
Access to social networks (TikTok, Facebook, etc.)	Not in the evening	Never
Access to online gaming (PlayStation Plus, etc.)	At all times	Never
Access to streaming live TV and sport	At all times	Never
Price	€40 / month	€60 / month

**M7 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER – ITEM ROTATION

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Not in the evening	At all times
Access to social networks (TikTok, Facebook, etc.)	At all times	Never
Access to online gaming (PlayStation Plus, etc.)	Not in the evening	Never
Access to streaming live TV and sport	Never	At all times



Price	€60 / month	€40 / month
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**M8 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Never	Not in the evening
Access to social networks (TikTok, Facebook, etc.)	Never	Not in the evening
Access to online gaming (PlayStation Plus, etc.)	Not in the evening	Never
Access to streaming live TV and sport	Not in the evening	Never
Price	€20 / month	€10 / month

**M9 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Not in the evening	At all times
Access to social networks (TikTok, Facebook, etc.)	Not in the evening	Never
Access to online gaming (PlayStation Plus, etc.)	Not in the evening	At all times
Access to streaming live TV and sport	At all times	Not in the evening
Price	€40 / month	€20 / month

**M10 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Never	At all times
Access to social networks (TikTok, Facebook, etc.)	Not in the evening	At all times

Access to online gaming (PlayStation Plus, etc.)	At all times	Not in the evening
Access to streaming live TV and sport	Not in the evening	At all times
Price	€20 / month	€60 / month

**M11 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	At all times	Never
Access to social networks (TikTok, Facebook, etc.)	At all times	Not in the evening
Access to online gaming (PlayStation Plus, etc.)	Not in the evening	Never
Access to streaming live TV and sport	Not in the evening	Never
Price	€40 / month	€20 / month

**M12 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Never	Not in the evening
Access to social networks (TikTok, Facebook, etc.)	At all times	Never
Access to online gaming (PlayStation Plus, etc.)	Never	At all times
Access to streaming live TV and sport	Not in the evening	Never
Price	€20 / month	€60 / month

**M13 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
--	--------------	--------------

Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Never	Not in the evening
Access to social networks (TikTok, Facebook, etc.)	Not in the evening	Never
Access to online gaming (PlayStation Plus, etc.)	Not in the evening	At all times
Access to streaming live TV and sport	Never	At all times
Price	€60 / month	€20 / month

### VERSION 3

**M6 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER – ITEM ROTATION

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Never	At all times
Access to social networks (TikTok, Facebook, etc.)	Never	At all times
Access to online gaming (PlayStation Plus, etc.)	Not in the evening	At all times
Access to streaming live TV and sport	Never	Not in the evening
Price	€10 / month	€60 / month

**M7 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER – ITEM ROTATION

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	At all times	Not in the evening
Access to social networks (TikTok, Facebook, etc.)	At all times	Not in the evening
Access to online gaming (PlayStation Plus, etc.)	Never	At all times
Access to streaming live TV and sport	Never	Not in the evening
Price	€10 / month	€60 / month

**M8 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Never	Not in the evening
Access to social networks (TikTok, Facebook, etc.)	Not in the evening	Never
Access to online gaming (PlayStation Plus, etc.)	Never	Not in the evening
Access to streaming live TV and sport	At all times	Never
Price	€10 / month	€20 / month

**M9 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Never	At all times
Access to social networks (TikTok, Facebook, etc.)	At all times	Not in the evening
Access to online gaming (PlayStation Plus, etc.)	Never	Not in the evening
Access to streaming live TV and sport	Never	At all times
Price	€40 / month	€10 / month

**M10 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Not in the evening	At all times
Access to social networks (TikTok, Facebook, etc.)	At all times	Not in the evening
Access to online gaming (PlayStation Plus, etc.)	At all times	Not in the evening
Access to streaming live TV and sport	At all times	Never
Price	€10 / month	€40 / month

**M11 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Never	Not in the evening
Access to social networks (TikTok, Facebook, etc.)	Not in the evening	Never
Access to online gaming (PlayStation Plus, etc.)	Not in the evening	Never
Access to streaming live TV and sport	Not in the evening	At all times
Price	€20 / month	€60 / month

**M12 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

*ONLY ONE POSSIBLE ANSWER*

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	At all times	Not in the evening
Access to social networks (TikTok, Facebook, etc.)	Never	At all times
Access to online gaming (PlayStation Plus, etc.)	Never	At all times
Access to streaming live TV and sport	Never	Not in the evening
Price	€20 / month	€40 / month

**M13 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

*ONLY ONE POSSIBLE ANSWER*

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Not in the evening	Never
Access to social networks (TikTok, Facebook, etc.)	Never	Not in the evening
Access to online gaming (PlayStation Plus, etc.)	Never	Not in the evening
Access to streaming live TV and sport	Not in the evening	At all times
Price	€40 / month	€60 / month

**VERSION 4**

**M6 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER – ITEM ROTATION

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	At all times	Never
Access to social networks (TikTok, Facebook, etc.)	At all times	Not in the evening
Access to online gaming (PlayStation Plus, etc.)	At all times	Not in the evening
Access to streaming live TV and sport	Never	Not in the evening
Price	€20 / month	€10 / month

**M7 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER – ITEM ROTATION

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Not in the evening	Never
Access to social networks (TikTok, Facebook, etc.)	At all times	Never
Access to online gaming (PlayStation Plus, etc.)	Never	At all times
Access to streaming live TV and sport	Not in the evening	At all times
Price	€60 / month	€10 / month

**M8 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Never	At all times
Access to social networks (TikTok, Facebook, etc.)	At all times	Not in the evening
Access to online gaming (PlayStation Plus, etc.)	Never	At all times
Access to streaming live TV and sport	At all times	Never

Price	€60 / month	€10 / month
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**M9 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

*ONLY ONE POSSIBLE ANSWER*

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	At all times	Never
Access to social networks (TikTok, Facebook, etc.)	Not in the evening	At all times
Access to online gaming (PlayStation Plus, etc.)	Not in the evening	At all times
Access to streaming live TV and sport	Not in the evening	At all times
Price	€60 / month	€10 / month

**M10 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

*ONLY ONE POSSIBLE ANSWER*

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Never	Not in the evening
Access to social networks (TikTok, Facebook, etc.)	Never	At all times
Access to online gaming (PlayStation Plus, etc.)	Never	At all times
Access to streaming live TV and sport	At all times	Never
Price	€40 / month	€10 / month

**M11 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

*ONLY ONE POSSIBLE ANSWER*

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Not in the evening	At all times
Access to social networks (TikTok, Facebook, etc.)	At all times	Never
Access to online gaming (PlayStation Plus, etc.)	Never	At all times
Access to streaming live TV and sport	At all times	Not in the evening

Price	€20 / month	€40 / month
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**M12 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Never	At all times
Access to social networks (TikTok, Facebook, etc.)	Never	Not in the evening
Access to online gaming (PlayStation Plus, etc.)	Never	At all times
Access to streaming live TV and sport	Not in the evening	Never
Price	€60 / month	€20 / month

**M13 Imagine you have to choose a new plan for your mobile internet access. Which of two following packages would you choose?**

ONLY ONE POSSIBLE ANSWER

Access to basic services (mails, browser, calls, etc.)	At all times	At all times
Access to video streaming and sharing (YouTube, Netflix, Amazon Prime Video, etc.)	Not in the evening	At all times
Access to social networks (TikTok, Facebook, etc.)	Never	Not in the evening
Access to online gaming (PlayStation Plus, etc.)	Not in the evening	Never
Access to streaming live TV and sport	Not in the evening	Never
Price	€10 / month	€40 / month

**IF M1 DIFFERENT FROM I DON'T KNOW**

**M14 You have indicated that you pay your mobile subscription(s) €XX [= answer F1] per month. How much would you be willing to pay at most for the same subscription(s) without access to the following content services: video streaming and sharing, online live TV, social networks and online gaming?**

ONLY ONE POSSIBLE ANSWER

- 91 - 100 % of current price (meaning €[= 91%\*answer M1]) to €[= answer M1])



- 81 - 90 % of current price (meaning  $\text{€} [= 81\% * \text{answer M1}]$ ) to  $\text{€} [= 90\% * \text{answer M1}]$ )
- 71 - 80 % of current price (meaning  $\text{€} [= 71\% * \text{answer M1}]$ ) to  $\text{€} [= 80\% * \text{answer M1}]$ )
- 61 - 70 % of current price (meaning  $\text{€} [= 61\% * \text{answer M1}]$ ) to  $\text{€} [= 70\% * \text{answer M1}]$ )
- 51 - 60 % of current price (meaning  $\text{€} [= 51\% * \text{answer M1}]$ ) to  $\text{€} [= 60\% * \text{answer M1}]$ )
- 41 - 50 % of current price (meaning  $\text{€} [= 41\% * \text{answer M1}]$ ) to  $\text{€} [= 50\% * \text{answer M1}]$ )
- 31 - 40 % of current price (meaning  $\text{€} [= 31\% * \text{answer M1}]$ ) to  $\text{€} [= 40\% * \text{answer M1}]$ )
- 21 - 30 % of current price (meaning  $\text{€} [= 21\% * \text{answer M1}]$ ) to  $\text{€} [= 30\% * \text{answer M1}]$ )
- 11 - 20 % of current price (meaning  $\text{€} [= 11\% * \text{answer M1}]$ ) to  $\text{€} [= 20\% * \text{answer M1}]$ )
- 0 – 10 % of current price (meaning  $\text{€} 0$  to  $\text{€} [= 10\% * \text{answer M1}]$ )

**IF M1 == I DON'T KNOW**

**M14bis** How much would you be willing to pay at most for your current subscription(s) without access to the following content services: video streaming and sharing, online live TV, social networks and online gaming?

ONLY ONE POSSIBLE ANSWER

- 91 - 100 % of current price
- 81 - 90 % of current price
- 71 - 80 % of current price
- 61 - 70 % of current price
- 51 - 60 % of current price
- 41 - 50 % of current price
- 31 - 40 % of current price
- 21 - 30 % of current price
- 11 - 20 % of current price
- 0 - 10 % of current price

**Thank you for your participation!**



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