

**OVER-THE-TOP (OTT) SERVICES:
Use of Internet-based instant messaging,
voice calls and other apps in Portugal and
the European Union**

(residential population)

December 2017

ANACOM

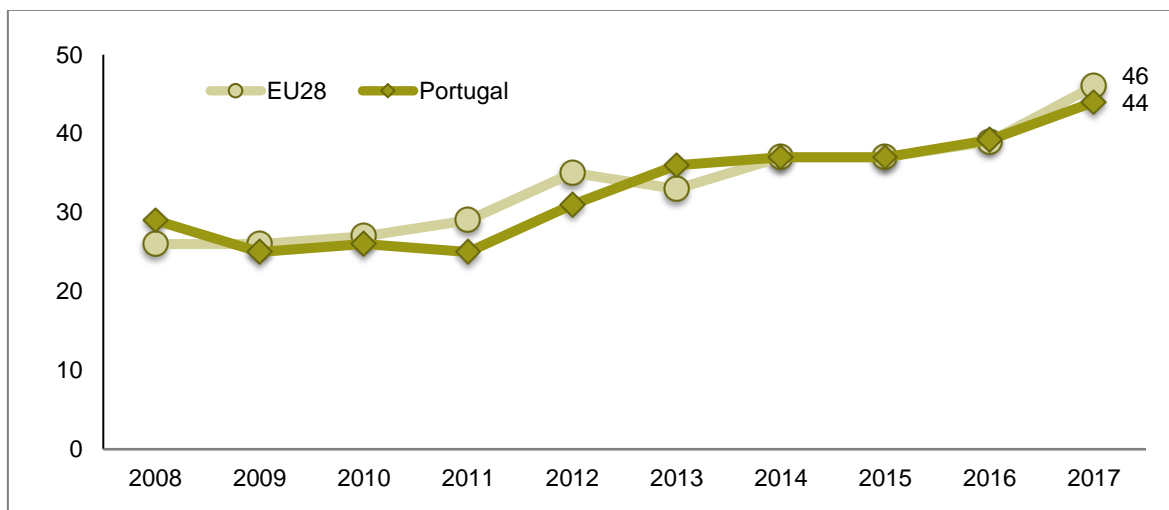
OTT services in Portugal and the EU in 2017

This report presents the information available on the use of Over-the-Top (OTT) services in Portugal and in the European Union (EU) in 2017, as well as the rate of substitution from traditional services, and the principal characteristics of the users of these services.

44% of Internet users make voice and video calls

According to the survey conducted by the European Commission¹ at the start of 2017, the percentage of Internet users making voice or video calls using the Internet in Portugal² was 44%, 5 percentage points (p.p.) more than the previous year. This is the highest annual growth since 2013. Portugal was in 21st position in the EU28 ranking.

Graph 1 – Internet users making voice/video calls over the Internet, Portugal and EU28



Unit: %

Source: European Commission, *Information and Communication Technologies in households and by individuals* (2008 and 2017)

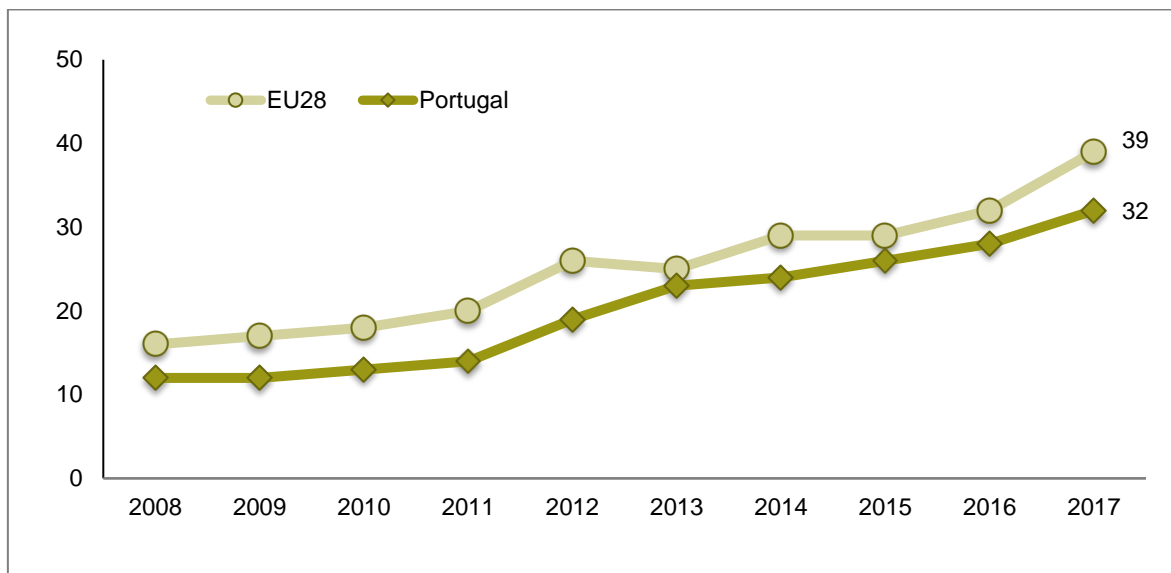
Base: Individuals aged between 16 and 74 who used Internet in the first three months of the year.

¹ *Information and Communication Technologies in households and by individuals* carried out by EU national statistical institutions and harmonized and compiled by Eurostat. This survey is conducted annually. The respondents were made up of resident households in Portugal with at least one individual aged between 16 and 74 years of age. The sample size was 7478 households in 2017. The reference period of the information is the interview for data on households, and the first quarter of 2017 for data relating to individuals.

² Voice or video calls over the Internet made between January and March of the respective year by individuals aged between 16 and 74 and who used the Internet in the first three months (excluding calls for professional purposes).

If the total number of individuals is considered, and not only Internet users, the penetration in Portugal would be 32%, 7 p.p. less than the EU28 average (this is the greatest difference recorded since 2012).

Graph 2 – Internet users making voice/video calls over the Internet, Portugal and EU28



Unit: %

Source: European Commission, *Information and Communication Technologies in households and by individuals* (2008 and 2017)

Base: Individuals aged between 16 and 74 years of age

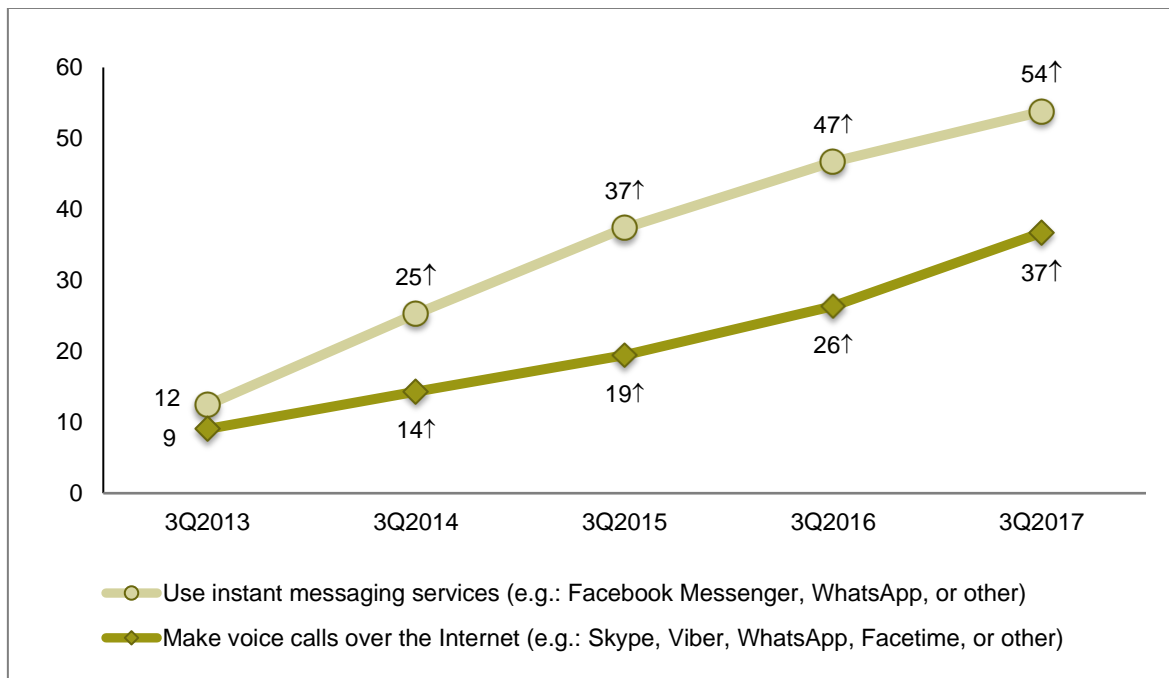
According to Marktest's Telecommunications Barometer (BTC)³, at the end of the 3rd quarter of 2017 (3Q2017), 37% of mobile phone users made voice calls over the Internet. Voice calls through the Internet were the over-the-top service with most increased use in the last year (+10.3 percentage points than in 3Q2016).

³ The *Telecommunications Barometer* (BTC) is a regular study developed by Marktest for the telecommunications sector. The population of the *Telecommunications Barometer* (BTC) – Fixed network comprises homes in Portugal with a sample size of 1,250 monthly interviews. The population of the *Telecommunications Barometer* - Mobile Network comprises individuals aged 10 and over living in Portugal with a sample size of 1,350 monthly interviews. Analysis of the BTC data is made for a quarterly period. i

Penetration of instant messaging exceeds 50% among mobile users

Instant messaging was used by 54% of mobile phone users.

Graph 3 – Mobile phone users using OTT services: voice calls and messaging



Unit: %

Source: ANACOM based on microdata from the Marktest BTC, 4Q2013 - 3Q2017.

Base: Individuals aged 10 years or over with a mobile phone.

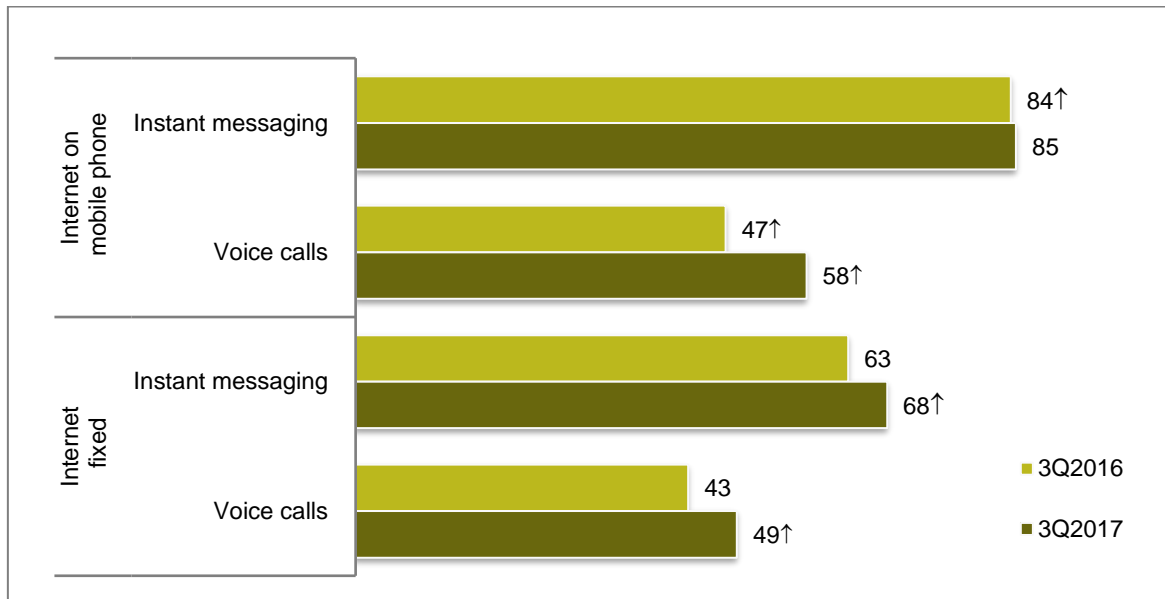
Note: All estimates are reliable (coefficient of variation of less than 10%)⁴. An upward arrow signals a statistically significant increase compared to the same quarter in the previous year⁵.

Contrary to what is the case with voice services, the penetration of instant messaging is higher among mobile phone Internet users than with fixed Internet users.

⁴ The coefficient of variation is used as a sampling error indicator, based on the variance of the "proportion" estimator of a simple random sample. The following classification is considered: reliable estimate when the coefficient of variation is less than 10%; acceptable estimate where the coefficient of variation is greater than or equal to 10% and less than 25%; unreliable estimate when the coefficient of variation is greater than or equal to 25%. The accuracy of the estimates does not only depend on the sample size, but is also influenced by the value of the estimate itself (e.g. for a fixed sample size, the reliability measured by the coefficient of variation is lower when the estimate value is lower).

⁵ This uses the statistical test of the difference between two proportions for large and independent samples, assuming a confidence level of 95 %.

Graph 4 – OTT services (voice calls and messaging): Mobile Internet v. Fixed Internet



Unit: %

Source: ANACOM based on microdata from the Marktest BTC, 3Q2016 and 3Q2017.

Base: Individuals aged 10 and over with mobile phone Internet; individuals aged 15 and over with fixed Internet at home

Note: All estimates are reliable (coefficient of variation of less than 10%)⁴. An upward arrow indicates a statistically significant increase compared to the same quarter in the previous year⁵.

Paid videostreaming users increase

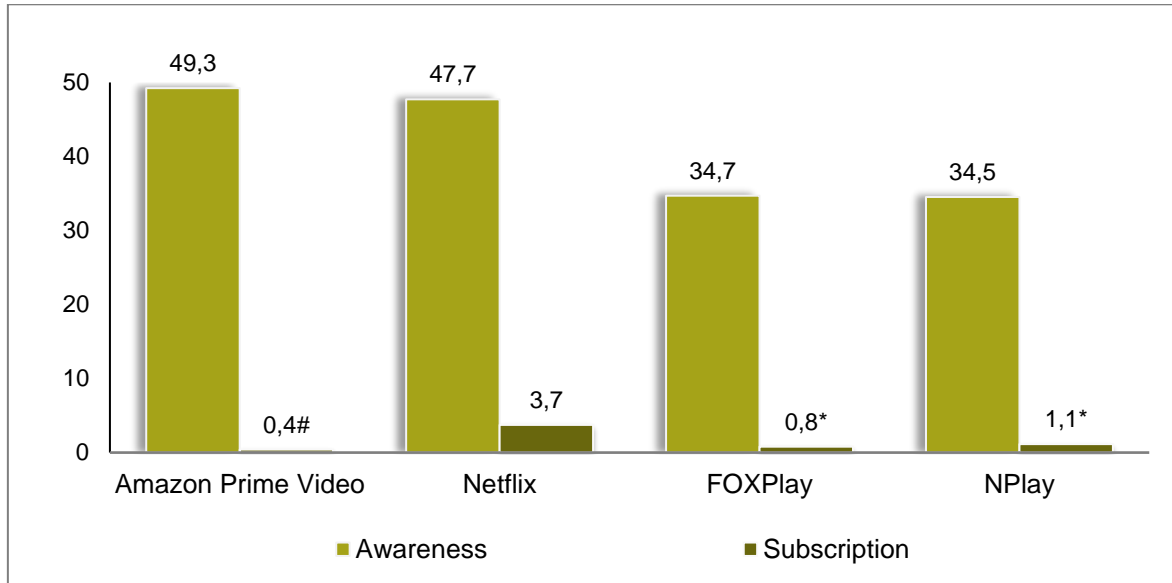
Services offering the consumer a collection of films and series for a monthly fee started in Portugal in the second quarter of 2015.

According to Marktest's Telecommunications Barometer (BTC), in 3Q2017, 5.5% of individuals aged 10 or over subscribed to at least one of these services (i.e. Netflix, NPlay⁶, FOXPlay and Amazon Prime Video), +2.3 percentage points than in the same quarter of the previous year.

Netflix users accessed this service using a PC or laptop (1 out of 2) and 45% accessed it through an app on a smartphone or tablet.

⁶ At the beginning of November 2017, NPlay was renamed as Nos Play.

Graph 5 – Awareness of and subscription to videostreaming on demand services



Unit: %

Source: ANACOM based on microdata from the Marktest BTC, 3Q2017.

Base: Individuals aged 10 or older

Note: Key to estimates: (#) Unreliable estimate; (*) Acceptable estimate; (no sign) Reliable estimate⁴.

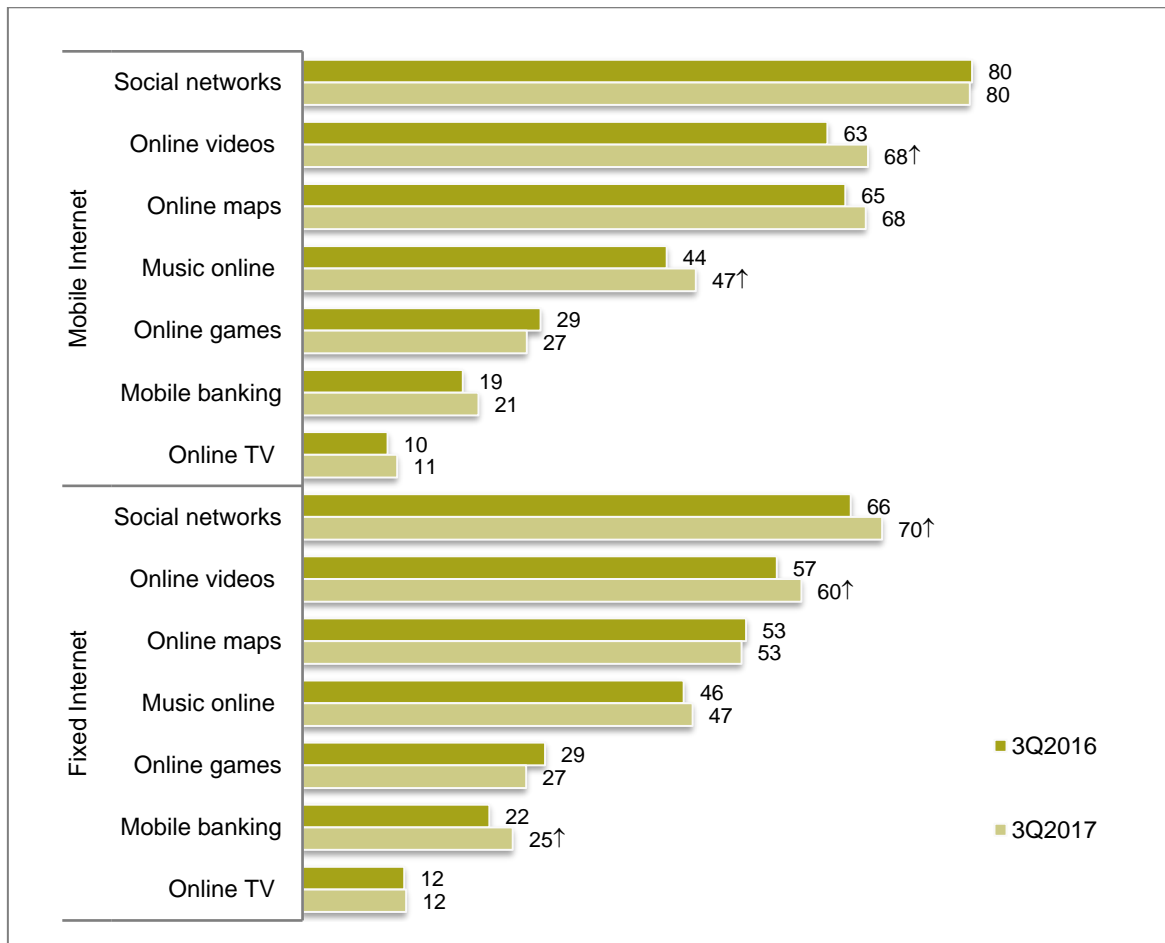
Social networks are the main applications used

Data from Marktest's Telecommunications Barometer for 3Q2017 shows that, among mobile phone Internet users, about 80% accessed social networks, 68% watched videos and consulted maps, 47% listened to music, 27% played online games, 21% accessed mobile banking, and 11% watched online TV.

In the case of fixed Internet users, the main applications are access to social networks (70%), map browsing (53%) and watching videos (60%).

Compared with the same period of the previous year, there was an increase in the use of online videos and music among mobile Internet users, and social networks, online videos and mobile banking among fixed Internet users (significant variations greater than 3 percentage points).

Graph 6 – Over-the-top (OTT) services using Internet access



Unit: %

Source: ANACOM based on microdata from the Marktest BTC, 3Q2016 and 3Q2017.

Base: Individuals aged 10 and over with mobile phone Internet; individuals aged 15 and over with fixed Internet at home

Note: All estimates are reliable (coefficient of variation of less than 10%)⁴. There were no significant differences from the previous quarter.

Portugal above the EU average for non-professional applications, below the average for mobile banking and e-commerce

According to the survey "*Information and Communication Technologies in households and by individuals*" regarding early 2017, usage of this type of application showed a higher service penetration rate in Portugal than the average in the EU28, with the exception of mobile banking and e-commerce.

Table 1 – Activities carried out over the Internet in the last 3 months by consumers, Portugal and EU28, 2017

	EU28 (%)	Portugal	Ranking	Var. EU28 (p.p.)	Var. Portugal 2016/17 (p.p.)
Activities carried out on the Internet for non-professional purposes					
Participating in social networks	65	76	8th	+11	+2
Posting self-created content on a website to be shared or viewed by other people	40	60	3rd	+20	+3
Sending/Receiving emails	86	80	18th	-6	-1
Access to information and entertainment					
Reading news on websites, online newspapers or magazines	72	80	13th	+8	+2
Searching for information on products or services	78	82	14th	+4	-1
Searching for information on health	61	69	9th	+8	0
Activities carried out over the Internet linked to civic participation and professional life					
Published opinions or comments on civic or political issues on websites	14	18	3rd	+4	:
Participated in online enquiries or polls to contribute to decision making for civic or political issues	10	15	3rd	+5	:
Participated in professional networks (created a user profile, posted messages or other contributions, such as in LinkedIn, Xing, etc.)	15	16	12th	+1	:
Carrying out other activities on the Internet					
Using travel or accommodation related services	50	33	21th	-17	+6
Selling goods or services, after contacting and negotiating with the buyer through the Internet (e.g. eBay)	22	11	21th	-11	0
Purchase of goods or online services	57	34	22th	-23	+1
Carrying out banking operations using Internet banking	61	42	24th	-19	+1

Unit: %, p.p.

Source: Eurostat, European ICT survey: "Information and Communication Technologies in households and by individuals" (2017); Data collected in the first quarter of the year.

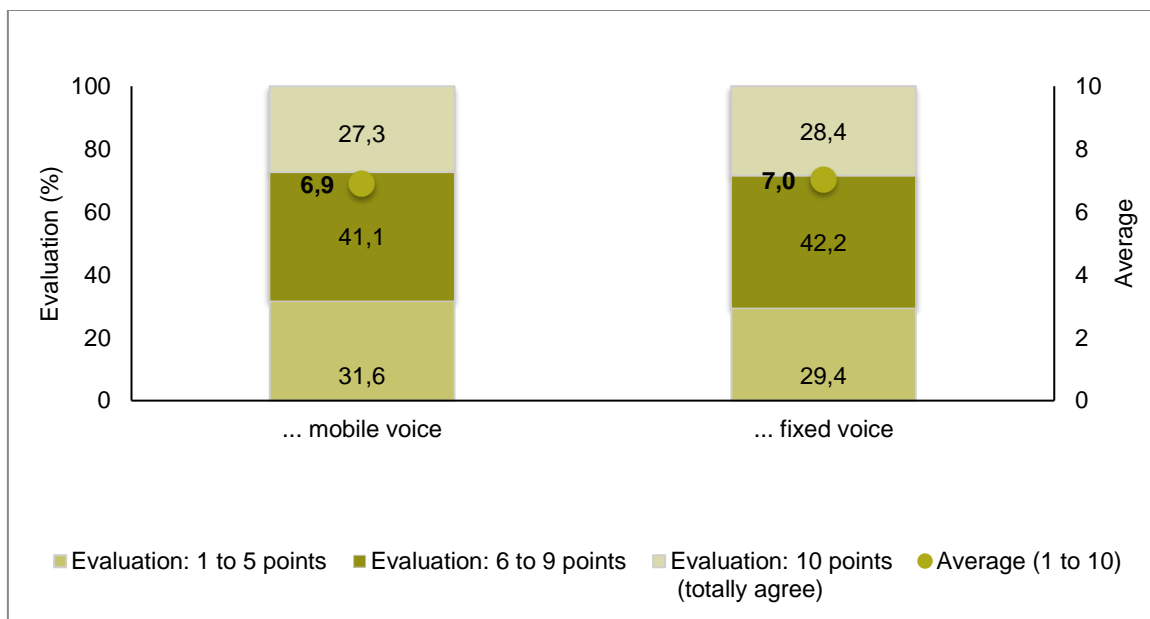
Base: Individuals aged between 16 and 74 who used Internet in the first three months of the year.

According to consumer perception, there is a high degree of substitution between traditional services and over-the-top services, although this is decreasing.

According to data from Marktest's BTC, in the 2Q2017 and on a scale from 1 (there is no substitution) to 10 (total substitution), consumers considered that the level of substitution between traditional services and OTT services was 6.9 and 7.0, respectively, for mobile voice and fixed voice.

Additionally, around 27% and 28% of consumers "totally agree" with substitution between traditional and OTT services, although this was less than that registered in the previous year (-3 percentage points).

Graph 7 – The use of Internet voice or messaging services has been replacing the use of traditional services...



Unit: %; scale 1 (totally disagree) to 10 (totally agree)

Source: ANACOM based on microdata from the Marktest BTC, 2Q2016.

Base: Individuals aged 10 or older

Note: All estimates are reliable (coefficient of variation of less than 10%)⁴.

Internet messaging and voice services through the Internet are used by younger people and by users with higher levels of educations

The social-demographic and economic profile of consumers of over-the-top services (users of Internet voice calls and users of instant messaging) was outlined, based on an estimate of an econometric discrete choice model - logit⁷ and using microdata from the Marktest's Telecommunications Barometer (BTC) concerning the 3rd quarter of 2017.

From this analysis it was concluded that⁸:

- Individuals aged less than 35 years of age with higher levels of education (secondary and higher education) are more likely to use instant messaging and voice calls over the Internet;
- Voice calls over the Internet tend to be greater among mobile Internet users living in Greater Lisbon and in Madeira, and among students with fixed Internet.

Between the end of 2015 and 3Q2016 the use of voice calls over the Internet increased. In the case of mobile Internet, the use of the services grew mainly among individuals aged 15-24 years of age and 45-54 years of age, along medium/high social classes (A/B) and among individuals with higher educational studies. In the case of fixed Internet, growth occurred in the 25 to 34-year age range⁹.

Portugal was above the EU28 average in the use of voice or video calls among Internet users for individuals with a higher level of education (with secondary and higher educational studies, +4 and +1 percentage points, respectively).

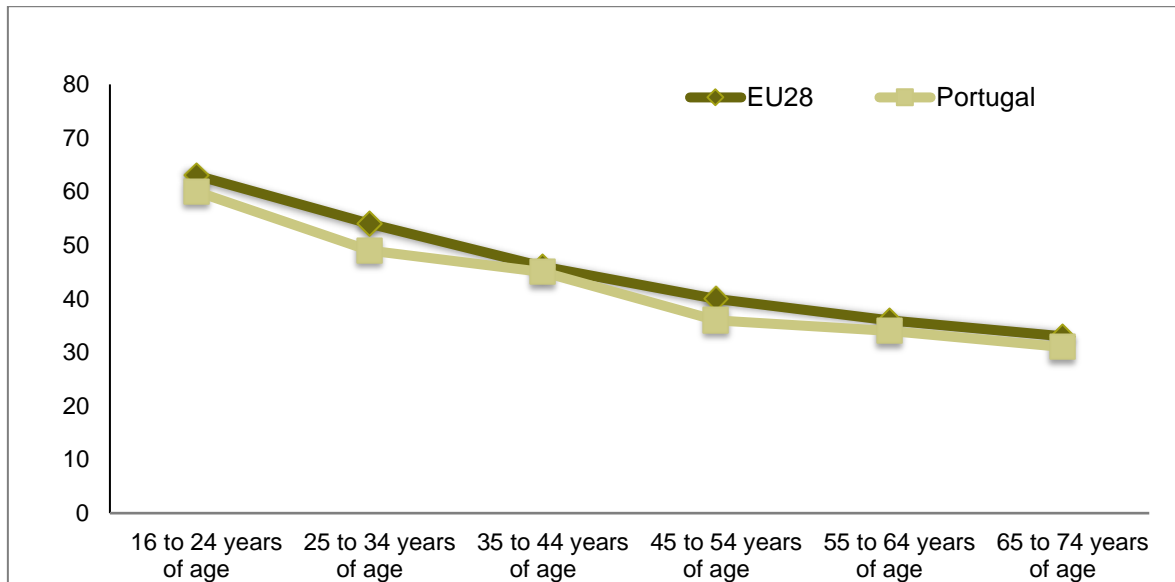
⁷ This type of model makes it possible to identify, in an integrated manner, the factors which distinguish users of services such as “Internet voice calls” and “instant messaging” among mobile phone Internet users (aged 10 and over) and among fixed Internet users (15 and over). The dependent variable is a binary variable which takes the value 1 where the individual uses the respective OTT service and 0 otherwise. The following discrete variables were taken as explanatory variables for the Marktest region, social class, age group, level of education, employment status, family size. The methodology used (logit model) is described in more detail in footnote 65 of ANACOM's 2011 *State of Communications* report.

⁸ Analysis carried out by and responsibility lying with ANACOM.

⁹ See attachment for more details.

Portugal was slightly below the average in all age groups.

Graph 8 – Use of voice or video calls among Internet users by age group



Unit: %

Source: Eurostat, European ICT survey: "Information and Communication Technologies in households and by individuals" (2017); Data collected in the first quarter of the year.

Base: Individuals aged between 16 and 74 who used Internet in the first three months of the year.

Between 2016 and 2017, the use of these services among younger users (16-24 years) and students grew more in the EU28 than in Portugal.

In addition, in different income quartiles, Portugal tends to use voice or video calls over the Internet among Internet users less when compared to the EU28 average.

Table 2 – Percentage of Internet users who made voice or video calls over the Internet, in terms of income, age group, level of education and employment status quartiles, Portugal and EU28

	2016				2017			
	EU28	Portugal	Ranking	Var. EU28 (p.p.)	EU28	Portugal	Ranking	Var. EU28 (p.p.)
Income quartiles								
1st quartile	36	41	15th	+5	43	43	18th	0
2nd quartile	34	35	18th	+1	42	39	20th	-3
3rd quartile	36	34	18th	-2	45	40	17th	-5
4th quartile	43	44	17th	+1	51	49	18th	-2
Age group								
16 to 24 years of age	54	59	14th	+5	63	60	21th	-3
25 to 34 years of age	46	41	22th	-5	54	49	22th	-5
35 to 44 years of age	38	36	22th	-2	46	45	21th	-1
45 to 54 years of age	33	33	18th	0	40	36	21th	-4
55 to 64 years of age	31	31	17th	0	36	34	19th	-2
65 to 74 years of age	29	26	22th	-3	33	31	22th	-2
Level of schooling								
Up to the 9th year	34	34	22th	0	41	35	22th	-6
Secondary education	36	39	17th	+3	44	48	15th	+4
Higher education	47	48	20th	+1	52	53	17th	1
Employment status								
Employed	39	37	21th	-2	47	42	21th	-5
Unemployed	36	36	22th	0	42	42	22th	0
Student	57	60	16th	+3	65	61	22th	-4
Retired and other non-working individuals	32	31	21th	-1	36	32	24th	-4

Unit: %, p.p.

Source: Eurostat, European ICT survey: "Information up and Communication Technologies in households and by individuals" (2016 and 2017); Data collected in the first quarter of the year.

Base: Individuals aged between 16 and 74 years of age, who used the Internet in the first 3 months of the year according to the respective characteristic