Competition concerns and definition issues in the ever evolving AVMS market

The Belgian case

Thesis presented by
Fabrizio Ciotti

Supervisor
Elisabeth De Ghellinck

Reader
Alexandre De Streele

Academic year 2017-2018

Master 120 en Sciences économiques, Orientation générale, Finalité spécialisée

Ecole d'économie de Louvain/UCL • Place Montesquieu 3 • 1348 Louvain-la-Neuve
Département des Sciences économiques/UNamur • Rempart de la Vierge 8 • 5000 Namur

Acknowledgments

I would like to thank:

My Promoter, Professor Elizabeth De Ghellinck, and my Reader, Professor Alexandre De Streel, for the precious advices and commentaries that helped me in writing my thesis. I would like to specially thank Professor Elizabeth De Ghellinck for the advices she gave me during this year that helped me to make a wiser decision for my professional future.

My ex-colleagues at BIPT, especially Professor Axel Desmedt for transmitting me his passion for Regulation, and Vincent Hanchir, who followed me and my work during all my internship.

All my friends and classmates that have accompanied me through my Master. I would like to specially acknowledge Lavinia, Chiara, Alessio, Pietro, Camilla, Daniele and Giulio for their friendship during these two years.

My family, for their love and support.

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Introduction

In recent years the audiovisual sector has been incurring a large revolution due to the introduction of new actors. Thanks to the development of a faster internet infrastructure, it has become possible to stream high quality audiovisual contents via the internet. Those new players are called over-the-top (OTT), since they transmit signals from their servers to consumers by free riding internet service providers' (ISP) infrastructures.

Their rapid growth and (relatively) large take-up among the population has worried incumbent operators for two main reasons. First, because their services generate a high internet consumption, this has direct drawbacks on the infrastructure usage of every client, with a high chance of generating congestions due to the high traffic. As a consequence, operators have been pushed to improve their infrastructures in order to satisfy the increasing clients' demand for download capacity. On the other hand, the higher internet consumption has been beneficial to operators that have seen a rise in their internet subscriptions. This has been the case in the last decades. Nowadays new network improvements can be difficult because of high investments costs and uncertainty of returns. Second, in countries such as Belgium, ISPs also sell pay-tv subscriptions. In these countries, operators fear that over-the-top (OTT) players may become new competitors and steal their audiovisual consumers. Moreover, this kind of competition is considered unfair because OTTs free ride the operators' network and thus do not incur the fixed costs borne by operators.

Given these issues, the incumbents have requested at national and supranational level a change in regulation. Currently, in Europe OTTs are not considered as being part of the same market as traditional television broadcasters, thus they do not incur the same regulatory obligations and competition appears distorted.

The European Commission, Council, and Parliament want to tackle this issue by reviewing regulation and directives, such as the General Data Protection Regulation, the European Electronic Communication Code, the Audiovisual and Media Regulation and the e-Privacy Regulation. While some steps forward were made to reduce the unequal treatment giving more freedom to traditional actors and imposing new obligations to the new ones, the solutions put forward seem moderate and show the will to maintain a separation between OTTs and traditional electronic communication services.

In fact, nowadays it has not been empirically proven by any regulatory authority whether audiovisual OTTs and pay-tv are substitutes or not. The main reason for this is that the take-up rates of OTTs audiovisual services are still marginal in comparison with television subscriptions. Moreover, OTTs consumption is generally considered as complementary, and not as substitute.

The aim of this study is to understand the competition and definition concerns in the audiovisual media services market. The definition of the relevant audiovisual market has become difficult for several reasons. First, laws and jurisprudence do not always define a clear framework. Second, traditional tools used to assess substitutability between services have demonstrated some inadequacies and showed a need to review the current analytical framework offered by the economic literature. Third, the structure of the digital market and the relationship between digital actors present on different layers is usually overlooked, not only when applying traditional tools, but also when addressing the net neutrality debate.

The thesis will be developed as follows. First, I will give an overview on OTT audiovisual services by defining the essential terminology and showing the economic weight of SVOD services in the European audiovisual market. Second, I will explain the main features of the review of the Audiovisual Media Service Directive. Third, I will present the Belgian case and its peculiarities. Fourth, I will go through the tools and methods used to define the relevant market. Fifth, I will explain the market structure in digital markets and the implications with assessing substitutability, and the net neutrality debate.

1. An overview on over-the-top audiovisual services

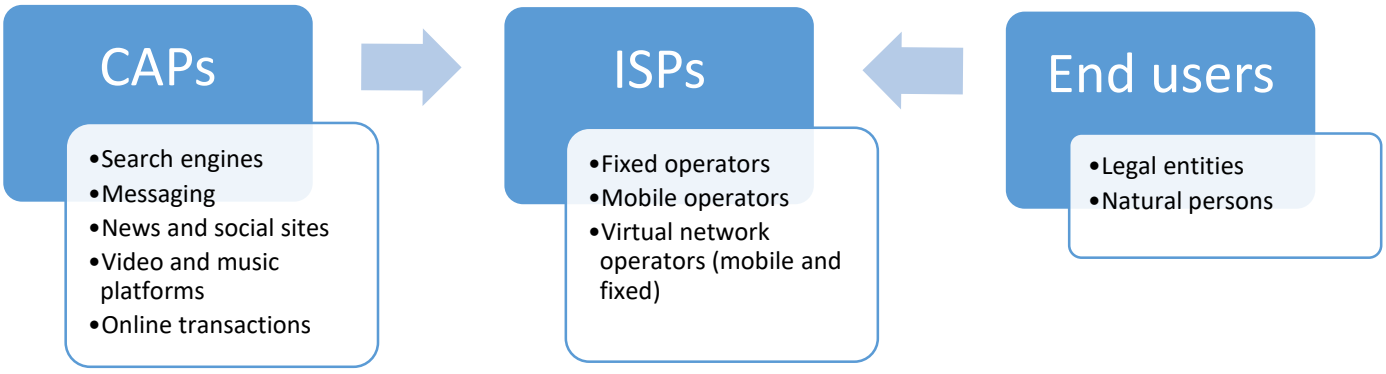
In this chapter I will clarify what over-the-top (OTT) services are and how they are generally defined by the European institutions (at the moment there is no legal definition). I will explain the different types of audiovisual OTTs and I will quantify their weight in the audiovisual sector. Moreover, I will explain why, for the purpose of this thesis, I will focus on Subscription Video On Demand (SVOD) OTTs.

1.1. Terminology: OTTs, ECS, ISS and AVMS

In order to understand what over-the-top (OTT) players are, it is necessary to describe the internet value chain and its fundamental economic entities (however, the list is not exhaustive, more actors could be included).

First, there are the Internet Service Providers (ISPs), which include all network operators as well as reseller of internet access (or virtual operators). These entities provide internet connections to end users. Second, there are Contents and Applications Providers (CAPs), which include all entities that provide services over the internet such as social networks, information websites, search engines, video platforms, and so on. Last but not least, we find the end users, which are normally the ones that pay for internet access and consumption of contents. As shown in figure 1.1, ISPs play a major role in the internet value chain, connecting CAPs and end users.

Figure 1.1: Internet value chain



Before going through the definition of OTTs and the different types that are present in the economy, it is necessary to define what we mean by Electronic Communication Service (ECS), which may often be confused with Information Society Service (ISS), and with Audiovisual Media Service (AVMS). The

distinction between these three types of services was made before the internet boom, and in recent years some difficulties appeared in identifying which definition best applies to new OTT services.

Following the definition given by the Directive 2002/21/EC on the regulatory framework for electronic communications networks and services, a service can be qualified as electronic communication if the following conditions are met: the service (i) is normally remunerated, (ii) consists wholly or mainly in the conveyance of signals, (iii) does not provide or exercise editorial control over contents.

The first criterion indicates that the service must have an economic nature. The remuneration does not have to be expressed directly in monetary terms and does not have to come directly from the end user. Financing the activity by advertisements[1] or personal data implies the economic nature of the activity. The second criterion, following the statement of the Body of European Regulators for Electronic Communications (BEREC) (2016), is problematic. One possible interpretation is given by the European Court of Justice (ECJ)[2], which indicates that if the provider of a service is responsible for the conveyance of signals towards end-users, then the second criterion is satisfied. This means that a service provider does not necessarily need to own the network infrastructure, but he must be able to guarantee that contents are delivered to customers.

The ECS definition has become of great importance in the last years given the evolution of OTTs services in the electronic communication markets. In fact, because of the broad definition in the 2002 Directive, there is no consensus among national regulatory authorities (NRAs) on whether some OTTs players can be qualified as ECS. As a consequence, it is not clear if they should or not fall under the regulatory regime[3].

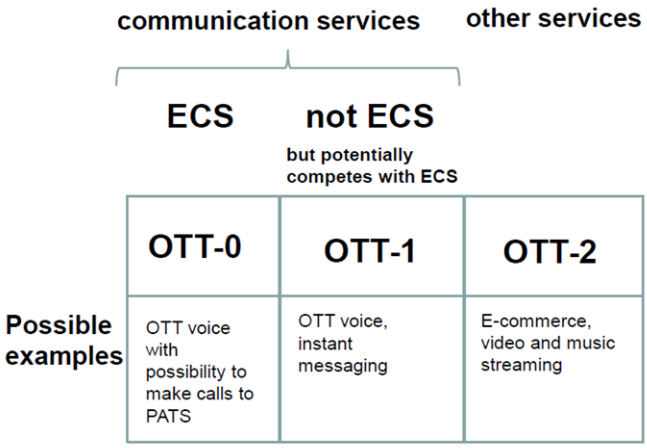
BEREC (2016) defined OTTs as any application, service or content that is delivered to end users through the open internet, normally without the operators' involvement. This definition has four main insights. First, OTTs contents can be provided also by a network operator, not only by a third party. Second, the definition is based on the way the service is delivered, not on its nature. Third, the definition does not

[1] See ECJ, 11 September 2014, Sotiris Papasavvas v O Fileleftheros Dimosia Etaireia Ltd and Others, Case C-291/13
[2] See ECJ, 30 April 2014, UPC DTH Sàrl v Nemzeti Média, Case C-475/12
[3] Regulatory regime is the set of rules imposed at a national or supra-national level to which firms must comply.

exclude OTTs from being considered as ECS. Fourth, OTTs, in some sectors, are potential competitors of ECS.

Moreover, BEREC identifies three types of OTTs. The first type is OTT-0, which encompasses OTTs services that can be inscribed in the ECS definition. The second is OTT-1, which includes all communication services that do not respect at least one of the ECS three criteria, but are potential competitors to ECS, i.e. that can be considered as substitutes. The third type is OTT-2, which is a residual category containing all OTTs services that do not fall in the two first categories.

Figure 1.2: OTTs Taxonomy



Source: BEREC, 2016

In the OTT-0 category there are all the voice services that provide also the possibility to make incoming or outgoing calls to the Publicly Available Telephone Service (PATS)[4]. In other words, these OTTs services can be used to call landlines and mobile numbers since they are responsible for the termination to the PATS[5].

BEREC considers all voice, instant messaging and mail services, such as WhatsApp, Viber, Skype, Gmail, Outlook and Yahoo! Mail, as OTT-1, thus as potential competitors to ECS. These OTTs provide similar ECSs' services, but do not comply with the second criterion of the ECS definition.

[4] See ERG (07) 56rev2, Common position on VoIP, 2007

[5] Some NRAs have argued that Viber Out and Skype Out should fall in this category (BIPT, 2016). Skype has recently appealed against the decision of the Belgian regulatory authority to define Skype Out as an ECS; the matter will be settled by the ECJ in the next months (BIPT, 2018)

OTTs audiovisual services fall in the OTT-2 category, thus they are regarded as services that are neither qualified as ECS, nor potential competitors. The last sentence must not mislead the reader. First, audiovisual OTTs are specifically excluded by the third criterion of the ECS definition, because by nature they exercise editorial control over contents. Second, they are not considered potential competitor since the economic nature of audiovisual OTTs do not consist in the conveyance of signals, but on contents provision. This is confirmed by the European Parliament (2015), which in its latest report on OTTs considers video delivered online as a potential competitor to traditional television broadcasters.

The OTT audiovisual services can fall under the definition of audiovisual media service (AVMS) set out in Article 1 of the 2010/13/EU Audiovisual Media Service Directive (AVMSD). The criteria that must be met are the following and can apply to linear and non-linear services (a definition of the two types of services will be given in section 1.2): (i) editorial responsibility of the media provider, (ii) the principal purpose is the provision of programs using electronic communications networks, (iii) these programs are "TV-like".

However, OTT audiovisual services fall also under the definition of Information Society Service (ISS) set out in Article 1 of the 2015/1535 Directive on rules on Information Society services. All online services that do not have to comply with sectorial regulation and are unmanaged[6], are considered ISSs and must comply with the E-commerce Directive 2000/31/EC. Indeed, ISS are "any service (i) normally provided for remuneration, (ii) at a distance, (iii) by electronic means and (iv) at the individual request of a recipient of services"[7]. Moreover, in the annex 1, the 2015/1535 Directive states that it does not apply only on linear television broadcasting services.

1.2. Types of audiovisual OTTs

Given the scope of this thesis, I will focus on audiovisual OTTs that can qualify as AVMS, hence those that also comply with the third criterion of the AVMSD. Therefore OTTs services that provide user generated contents (UGC) such as YouTube, Twitch.TV, and Dailymotion, will not be considered. In fact,

[6] Unmanaged means that the owner of the electronic network on which the service is provided does not control the service.
[7] Article 1(1b) of Directive 2015/1535

these services do not respect the first criterion of the AVMS definition since they do not exercise editorial control over the contents provided.

In order to understand the different types of audiovisual OTTs, a first distinction must be made between linear and non-linear audiovisual contents. The former are provided by audiovisual media services simultaneously to all viewers, following a program schedule. The latter are provided by audiovisual media services when the user selects the content from a provided catalogue.

Linear AVMS are usually provided by analogue and digital (terrestrial, IPTV, cable or satellite) television, and recently also by OTTs. Online platforms supplying linear contents are usually established by already existing television broadcasters that want to retransmit live contents also via their own online websites or applications. Furthermore, in recent years other independent linear OTTs offers have been developed[8].

Non-linear AVMS are usually provided by both pay-tv broadcasters and OTTs. A first kind of service is called catch-up television. It enables the viewer to have a delayed access to an already transmitted content from the linear offer. This is possible through the television decoder or via the broadcaster's OTT application or website. This function can also be offered by a linear OTT. Video On Demand (VOD) is a second kind of non-linear AVMS. It enables the user to have access to a catalogue of movies or shows. Against a payment it is possible to view a single element for a limited period of time or for limited views. These offers are usually provided by television broadcasters through their digital or online platforms, or by OTTs. The third and last kind of non-linear AVMS concerns the Subscription Video On Demand (SVOD) services. Like the previous service, it enables users to choose from a catalogue the desired content. The payment is not made for each single content, but is done through a monthly subscription, giving the viewer unlimited access to all available contents, like an all you can eat formula. This kind of AVMS is provided by standalone OTTs such as Netflix, Hulu or Amazon Prime, or by the operators' TV box.

[8] For example, Stievie was launched in 2015 in Belgium providing free online linear television. In 2017 a premium paid subscription was also launched (https://stievie.be/)

Table 1.1: Types of AVMS

Types of AVMS	**Analog**	**Digital (terrestrial, IPTV, cable, satellite)**	**OTT**
Linear	✓	✓	✓
Non-linear			
Catch-up	×	✓	✓
VOD	×	✓	✓
SVOD	×	✓	✓

What is clear from this brief taxonomy of AVMS is that OTTs are, at present, able to offer all kinds of AVMS. Moreover, non-linear AVMS provided by traditional television broadcasters are generally also offered to their viewers via their TV box or OTTs services. It is important to point out that, according to the European Commission in the Liberty Global/Ziggo merger case, OTTs services owned by traditional television broadcasters are complementary to their linear broadcasting activity[9]. In order to better understand what this imply, let's consider the example of Sky. Sky offers an OTT complementary service, called Sky GO, which retransmits and provides the VOD contents available with the pay-tv subscription, and is offered only to already existing customers. Sky has recently launched in the United Kingdom, Ireland and Italy a standalone service called NOW TV providing live streaming and video on demand, against the payment of a monthly subscription. This new service can be inscribed in the OTT SVOD category and can be considered as independent from the linear broadcasting activity of Sky given the fact that it is offered to any customer.

What is sometimes not clear, is the border between linear and non-linear television, since occasionally the two types of service can be offered by both digital and OTTs providers, and sometimes the consumer may perceive the two types as substitutes. The question whether linear and non-linear television services are in the same market has been already problematic in some merger case and market analysis. For example, in the Liberty Global/Ziggo aforementioned case, the European

[9] See EC (2014), Liberty Global/Ziggo, Case M.7000

Commission left the question open, while in the previous News Corp/ BSkyB merger case[10] the European Commission considered that the two markets should be separated.

1.2.1. Linear VS non-linear viewing

In this sub-section I will present a case study done by Kantar (Kantar Media, 2016) and ordered by Ofcom, the NRA for the telecommunication market in United Kingdom. The aim of Kantar's investigation was to understand viewers' consumption habits and their perception towards traditional television alongside on-demand services. This research shed light on understanding the qualitative differences between the two types of services, useful to understand if there is substitutability from a consumer perspective. Moreover, the main findings of this study will compared with the Belgian case, presented in section 3.2.2. .

Viewing habits highly depends on the age of the individual. Age has implications over technology mastery and familiarity that tends to be reflected over the consumption decision between linear and non-linear viewing. The young population (19-24) prefers non-linear viewing for various reasons: personalization of the on-demand services, flexibility (whenever, wherever, whatever) and consumption independence from the other family members. Mid-aged people (25-54) have mixed tastes. Mid-aged individuals do not have precise strong preferences between the two types of services and the usage of non-linear consumption is often due to tight time schedules. The oldest population (55+) strongly prefers linear viewing because of the general unfamiliarity with new technologies and no need of flexibility, both in terms of time and portability.

Linear and non-linear viewing present different strengths and weakness in terms of viewing characteristics. According to the surveyed individuals, linear television has the advantage of the in-the-moment viewing, which give the viewer the possibility to be the first watching a media content and, thus, does not incur into spoilers[11]. This is extremely relevant for news and live sports programs. The weaknesses of linear viewing lie in the annoyance caused by advertisement, waiting time between episodes of a show, and the need to fit within the scheduled time of the programs.

[10] See EC (2010), News Corp/ BSkyB, Case M.5932

[11] Spoiler is a word used by younger generations and means to reveal an aspect that was previously unknown (for example, to reveal to someone the finale of a movie that he has not seen yet).

Table 1.2: Strengths and Weaknesses of Linear viewing

Strengths	Weaknesses
Get to view first	Annoying adverts
No spoilers	Need to fit with scheduled time
Social viewing experience	Less personal choice
Familiar	Waiting time for next episode

Source: Adaptation from Kentar Media, 2016

With respect to non-linear viewing and in particular of SVOD services, the most important strengths identified are the contents, in terms of quantity and exclusivity. SVOD services are also appreciated thanks to the absence of advertisements, recommendations systems, access to other countries' shows and the possibility to watch the contents when it most fits the time schedule of the viewer. The weaknesses identified include the subscription fees, low quality of non-exclusive titles and data allowances. The biggest drawback is the overwhelming choice. It is difficult and time consuming for users to find the right content to watch in a large catalogue. What has been associated with a bad and a good aspect of SVOD is the ability to binge watching, i.e. watching consequently multiple episodes. In fact, for some viewers that do not have time during the week, to be able to watch several hours of contents in a little window is a strength. However, it has also a negative connotation since binge watching is addictive and it has been argued to be harmful for a person's health[12].

[12] Problems caused by binge-watching could go even deeper than previously thought, retrieved on the website of Business Insider UK : http://uk.businessinsider.com/tv-binge-watching-can-damage-your-health-2017-9?r=UK&IR=T

Table 1.3: Strengths and Weaknesses of non-linear SVOD viewing

Strengths	**Weaknesses**
High volume of content	Subscription fees
No adverts	Low content quality of non-exclusives
Subtitles and other languages available	Overwhelming choice
Exclusive contents	Unfamiliar for some people
Recommendation systems	Streaming depending on internet connection
The on-demand aspect	Data allowances
Cross platform watching	Binge watching
Access to show from other countries	
Binge watching	

Source: Adaptation from Kentar Media, 2016

Devices also play a major role in the choice of linear or non-linear viewing. The vast majority of participants prefer watching linear programs on television because they are usually watched through the set-top box of the broadcaster connected to the television, and also for comfort reasons. Only a small fraction of the individuals use personal electronic devices, generally because they have no other choice. TV sets are also preferred in non-linear viewing by the majority of the population. However, younger individuals prefer to use personal electronic devices because they are free to watch the content desired, independently from other family members' tastes. Moreover, navigation in catalogues is perceived easier with these devices with respect to television remote control. Portability also plays a small role.

Another relevant aspect that influence viewing preferences are switching costs associated with traditional television and SVOD OTTs. The principal drivers that motivate switching between linear television providers are price, bundle considerations, and service levels. Contents acquire only a secondary dimension, given that programs provided by television operators are perceived as similar. However, users face barriers and limitations when switching. This kind of operation require effort, in terms of time and require the payment for replacing equipment, and possible cuts of service. Instead, contents play a major role in motivating viewers to switch between online platforms. Moreover, SVOD services are associated with low barriers to switching, given the low effort to put an end to monthly

contracts (instead of the long-term contracts of traditional television) and the no need for a change in equipment.

Mid-age and older people consider online on-demand services and traditional television as complement, rather than substitutes. These users integrate platforms as YouTube and Netflix in their audiovisual consumption. Whilst a great proportion of younger individuals consider online contents as a valid alternative to traditional television. The way the good can be consumed, the flexibility of the contract and the low cost subscription best fit with younger aged lifestyle.

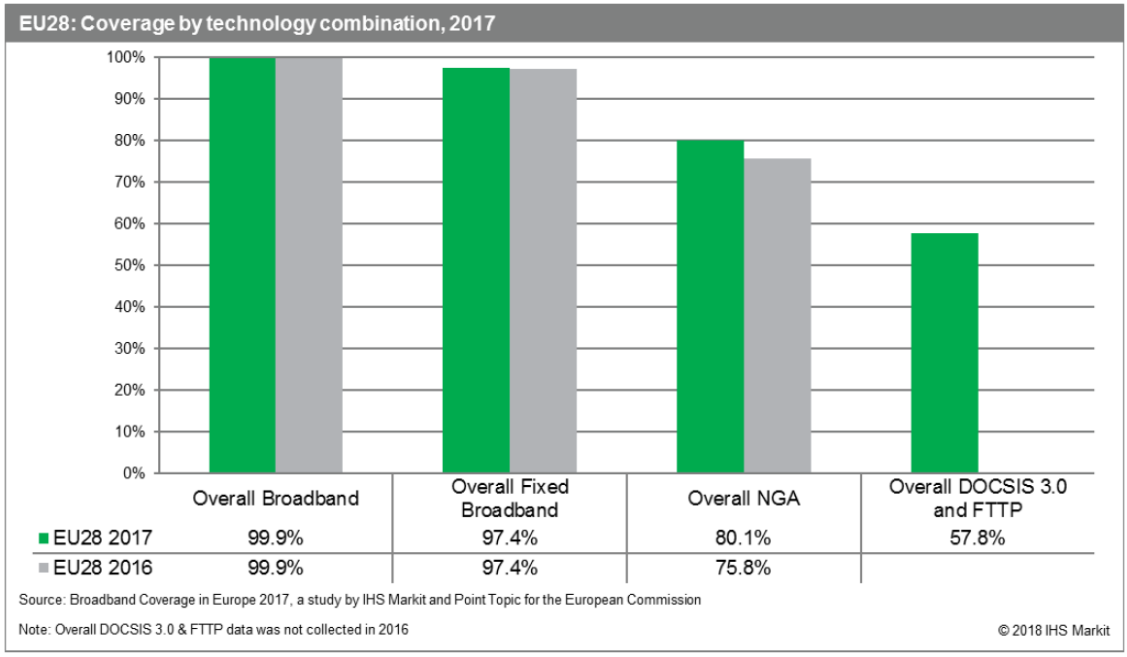
1.3. Economic weight of SVOD in the European audiovisual market

For the purpose of this thesis, I will analyse the economic competitive relationship between traditional television broadcaster and the OTTs that qualify as AVMS. Moreover, the OTTs taken into consideration are independent standalone SVOD services. The reason of such choice can be summarized in three key thoughts.

First, the subscriptions offered by traditional pay-tv and SVOD OTTs are similar. The customer has access to the contents provided on an unlimited basis through (generally) a monthly payment subscription. Second, standalone SVOD OTTs are the dominant actors in the SVOD market segment. Finally, as described in this section, SVODs are rapidly becoming major economic actors in audiovisual subscription services, drastically changing the audiovisual ecosystem.

In the recent years, the extension and upgrade of broadband networks has enabled the possibility to transmit audiovisual contents over the internet. Faster upload and download speed, implementation of new transmission technologies such as fibre optics, made it possible to provide high definition streaming to users. In Europe, the broadband coverage has not ceased to grow, as it is shown in figure 1.3.

Figure 1.3: Coverage by technology combination in the EU28 in 2017



Source: European Commission, 2018

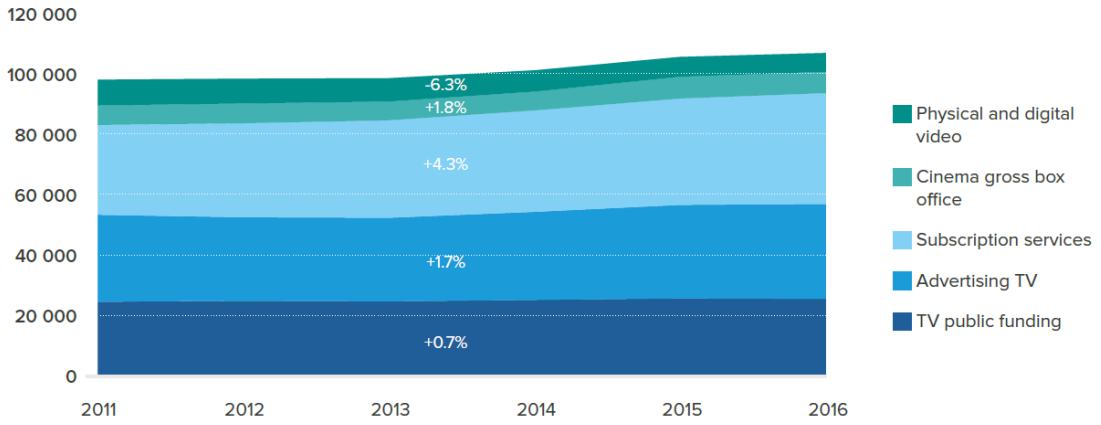
Overall NGA (New Generation Access) coverage[13] is increasing. NGA defined as VDSL (Very-high-bit-rate Digital Subscriber Line), cable DOCSIS 3.0 and FTTP (Fibre-To-The-Point), technologies that are capable to achieve at least 30mbps of speed, have reached in 2017 the 80,1% of houses. Furthermore, if we consider only the technologies capable to achieve at least 100Mbps of speed (cable DOCSIS 3.0 and FTTP), coverage reached 57,8% of houses in 2017 (European Commission, 2018).

The disruption and simplification of the traditional value chain in the audiovisual sector triggered by the spread of the internet made it possible to enact strategies of direct and low price distribution of contents to viewers. In this new scenario, traditional television broadcasters feel the new internet competitors as a serious danger for their business (Cabrera Blázquez et al., 2016).

In 2016 the European audiovisual market accounted for 107 billion euro (IDATE, 2016). As it is shown in figure 1.4, from 2011 to 2016, it has grown by 1,7%, on an annual average. The main growing segment was the subscription services, which includes traditional pay-tv and SVOD OTTs, with an annual growth average of 4,3%.

[13] Coverage is defined as the % of houses that are passed by each individual technology (European Commission, 2018)

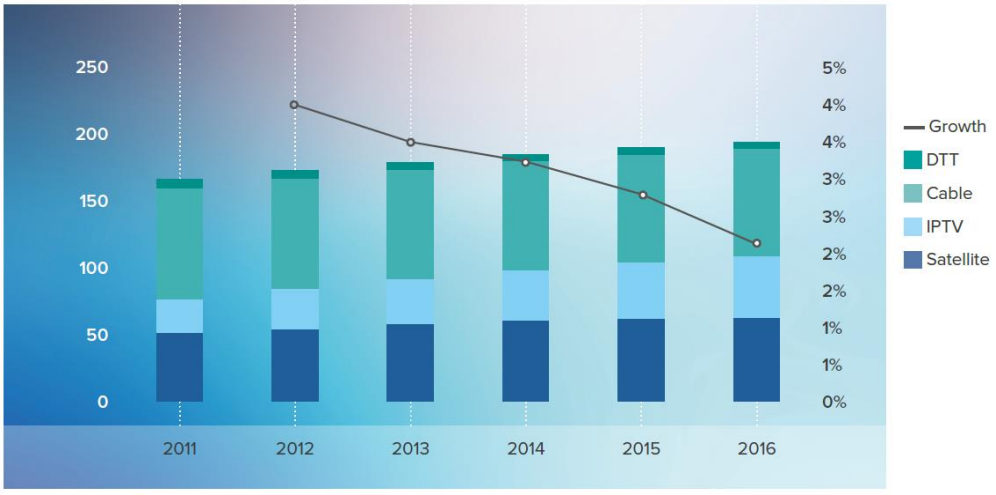
Figure 1.4: The audiovisual market in European Union and average annual growth rates (2011-2016), in million EUR and %



Source: European Audiovisual Observatory, 2018

Despite the entrance of new OTTs actors in the audiovisual market, the number of pay-tv subscribers in Europe has not ceased to increase. However, in the last years, growth has started to slow down, as shown in figure 1.5. Moreover, in some European countries such as Germany and the United Kingdom, subscribers' growth has reached a breaking point. In 2016, in Germany the number of subscribers increased by 0,6%, while, during the same year, the United Kingdom experienced a shrink of -0,6% (IDATE, 2016).

Figure 1.5: Pay-tv subscribers in Europe by network and growth rate (2011-2016), in million subscribers and %



Source: European Audiovisual Observatory, 2018

Furthermore, growth among the subscriber segment of the market is mainly lead by the SVOD OTTs. Even if in 2016 it represented only 7% of the subscription services, SVOD accounted for 60% of the total

growth of that market segment. From 2011 to 2016, SVOD consumer base grew by 55,5%. In 2016, 38,7 million European viewers had a SVOD subscription (European Audiovisual Observatory, 2018), and the two dominant (OTTs) SVOD firms are Netflix and Amazon, that combined own 67% of the European market (see table 1.4).

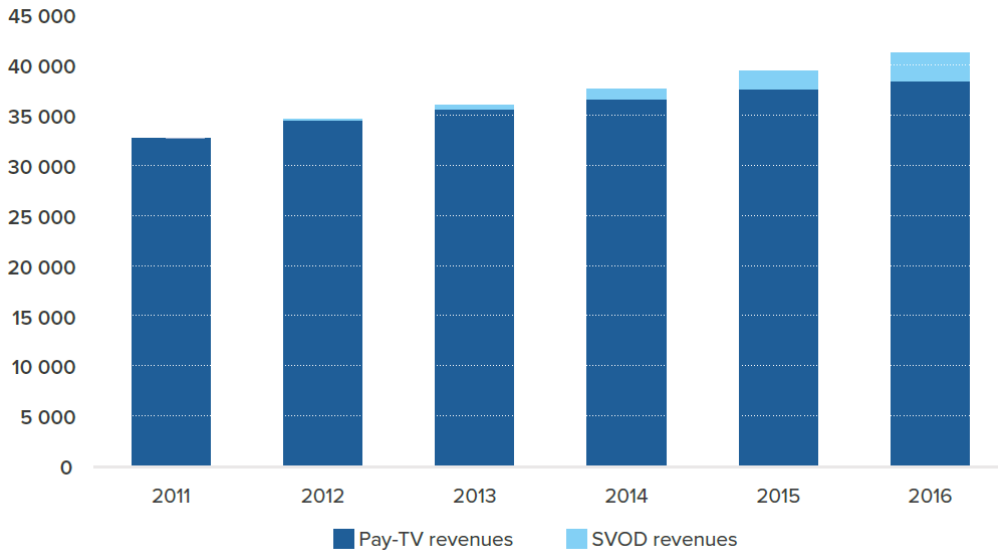
Table 1.4: Main SVOD services active in EU27 in 2016

SVOD service	Subscribers (thousand)	European market share
Netflix	18 175	47%
Amazon	7 632	20%
Sky	1 597	4%
Maxdome	976	3%
Timvision	746	2%
Yomvi	714	2%
Canal Play	568	1%
HBO	533	1%
Wuaki	505	1%
Voyo	464	1%
Ipla	463	1%
Disney	410	1%
Mediaset	387	1%
VOD.pl	367	1%
C MORE	360	1%
Other	4 845	13%
Total	38 742	100%

Source: European Audiovisual Observatory, 2018

In terms of revenues, both traditional pay-tv services and SVOD OTTs have experienced a continued increase. The former's growth has slowed down in the last years, increasing only by 2,8% in 2016. The latter, instead, has and still is growing at a faster pace. On an annual average, from 2011 to 2016, the revenues grew by 128%, and in 2016 SVOD services generated 1,6 billion revenues (European Audiovisual Observatory, 2018).

Figure 1.6: Pay-services revenue in Europe (2011-2016), in million EUR



Source: European Audiovisual Observatory, 2018

It has been argued that the entrance of SVOD actors in the audiovisual market has been the reason for the recently experienced stagnation in terms of revenues and subscribers of traditional television broadcasters, meaning that the new players are stealing the incumbents' customers. So far there is no clear evidence of this, neither the fact that the two services are substitutes and competing for the same customers (European Audiovisual Observatory). Nevertheless, operators have requested a fairer level playing field, arguing that regulation imposed heavier burdens on them with respect to OTTs players (EPRS, 2016). For this reason in the next chapter I will review the present regulation involving AVMSs.

2. Audiovisual Media Service Directive

In this chapter I will present the main features of the proposal for the review of the AVMSD. In particular, I will show how some steps forward have been made in order to achieve a level playing field between incumbent operators and OTTs.

On May 2015 the European Commission adopted the Digital Single Market (DSM) strategy. The aim of this initiative is to enhance European digital economy by favouring access to digital goods to consumers and business, increasing consumers' protection, and by creating a level playing field in order to have the right conditions for fair competition.

In order to do so, a review of the legislative framework has been proposed. A first step in this direction translated in the adoption of the General Data Protection Directive (GDPR) in 2018. In the meantime, the European Electronic Communication Code (EECC), ePrivacy Regulation (ePR) and the Audiovisual Media Service Directive (AVMSD) are being reviewed and new versions will be adopted in the next years. What is clear from the new legislation set is that the role of OTTs in the digital economy is recognized by the European institutions. Moreover, a convergence in regulatory treatment between traditional and new players has begun, but a separation between OTT and traditional services still persist.

The Audiovisual Media Service Directive has different aims: promote cultural and media pluralism, create a single European audiovisual market, and ensure consumers' protection. In order to stay at pace with technological advancements, in 2010 the Directive was reviewed and on-demand services were added in the AVMS definition. After the adoption of the DSM strategy in 2015, a new review was considered necessary because of the recent changes in the audiovisual market due to the fast development of OTTs services. In 2016 the European Commission adopted a legislative proposal that revised different areas of the 2010 Directive. One of the most crucial points that has been tackled was the lack of a level playing field between incumbent broadcasters and providers of on demand services. By lack of level playing field we mean that one subject provider is advantaged by regulation because it has to bear lighter obligations with respect to another similar subject (European Parliament, 2015). As a matter of fact, in the 2010 Directive, non-linear audiovisual services do not have to comply with different rules imposed to traditional broadcasters.

First, there is an unequal level of protection of minors. The rules set in the 2010 Directive only apply to linear AVMS, while on-demand services are completely exempted. This situation cannot be justified anymore since youngsters are now mainly watching audiovisual contents through online on-demand platforms. For example, more than a half of Flemish viewers from 15 to 19 years old watch audiovisual contents exclusively online (Imec, 2017).

Second, the Directive imposes different levels of contribution for the promotion of European works[14]. For audiovisual contents no level of contribution was fixed. Article 13 of the 2010 Directive only invites Member States to ensure that on-demand AVMS providers promote European works, giving freedom to NRAs to fix the wanted minimum quota. Instead, Article 16 asks traditional broadcasters to reserve a majority of their transmission time to European works, and Article 17 fixes a 10% quota of transmission time or budget for European works created by producers who are independent of broadcasters. Quota from Article 16 and 17 can be raised if the NRA considers it as necessary, but not lowered.

Last, the liberty given to Member States to fix the European works quota for on-demand services resulted in heterogeneous levels of contribution, as it is pictured in figure 2.1. The Directive follows a country-of-origin principle, meaning that AVMS providers are only obliged to follow the rules of the country in which they are established, but can operate in the entire single market. This could have brought providers to establish themselves in countries with lower quota in order to escape from stringent levels and gain competitive advantage[15] (Cabrera Blázquez et al., 2016).

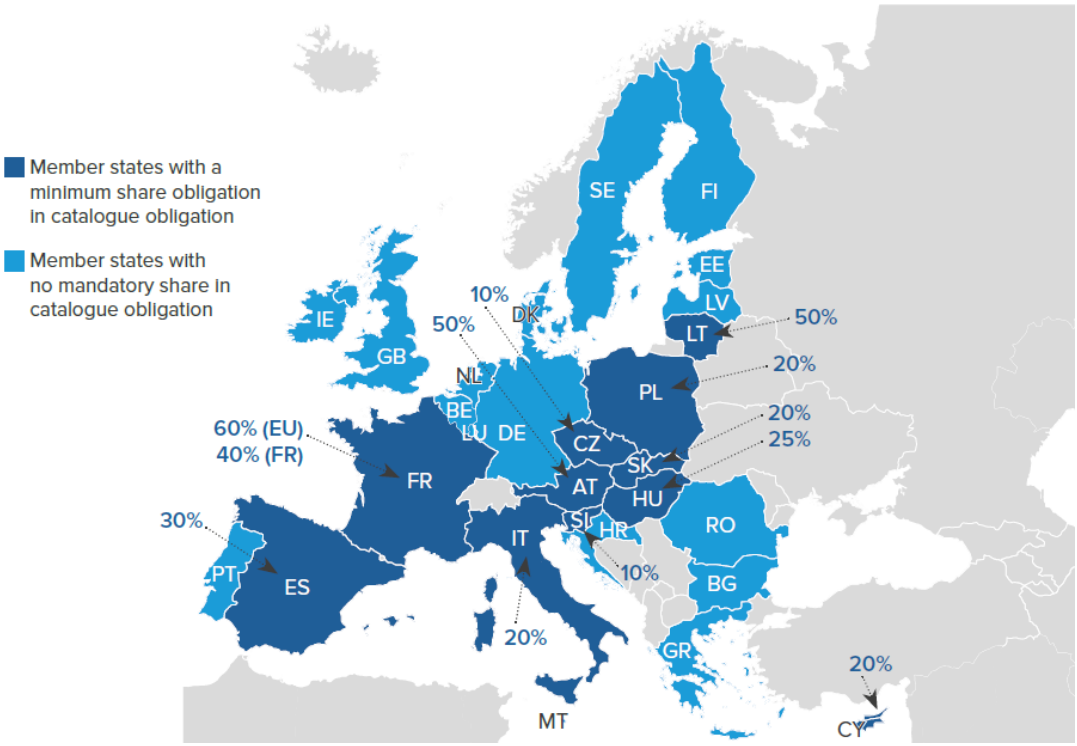
It has been assessed that the aforementioned differences in obligations put traditional broadcasters to a competitive disadvantage. Moreover, given the rise of online video platforms, minors may be exposed easily to harmful contents if things are left as they are (European Commission, 2016).

[14] By European works the Directive means audiovisual contents that have either originated in Member States, or originated in European States that signed the Convention on Transfrontier Television of the Council of Europe, or co-produced between EU and third countries and the majority of the production costs are incurred by the European producer

[15] "For example, in the 1990s certain operator established in Poland co-financed substantially Polish films under an agreement with the Polish government. This continued until a different operator established in Hungary started to broadcast targeting Polish audiences but without any contribution to Polish cinema. This resulted in a competitive disadvantage as a consequence of which investment in Polish films was considerably reduced." (European Commission, 2016)

In April 2018 a preliminary agreement between the European Commission, Parliament and Council has been reached. One of the major features of the review is that UGC shared on video platforms will be included in the Directive in order to protect younger people from harmful contents. With respect to the three issues discussed before, the answer to the lack of level playing field consists in different adjustments. Rules for protecting minors will be extended to on-demand services, a quota of 30% of European works in video catalogues offered by on-demand services will be required, and the country-of-origin principle will be strengthen by giving the possibility to Member States targeted by providers established in another European country to impose financial obligations in order to restore the differences in quota.

Figure 2.1: The share of European works in VOD catalogues under the current AVMS Directive



Source: European Audiovisual Observatory, 2018

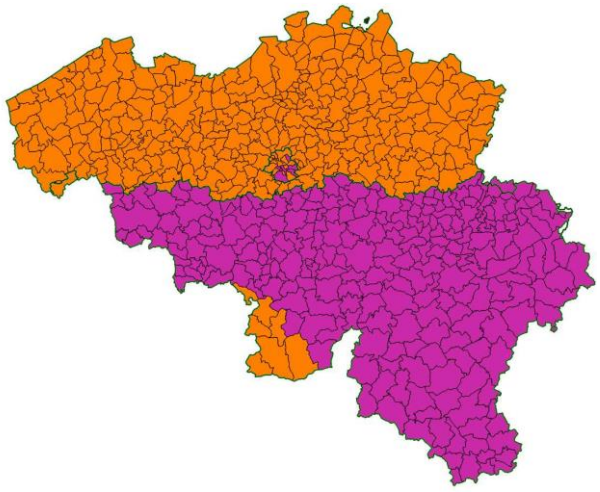
3. The Belgian case

3.1. Why Belgium?

Belgium represents an interesting case for audiovisual regulation for different reasons. First, the Belgian market for telecommunications is very concentrated. Second, Belgian NRAs, through the Conférence des régulateurs du secteur des communications électroniques (CRC)[16], regulate the wholesale television market that is not listed anymore in the 2010 Recommendation as a market susceptible of ex-ante regulation. Third, the broadband and television analysis was conducted very recently. Fourth, Belgium is the leading country in Europe in NGA broadband (>30 Mbps) penetration, with a coverage reaching 94,9% of the population (CRC, 2018). This last feature is important, since it is necessary to have access to fast internet in order to consume audiovisual contents online in a quality definition comparable to television.

Belgium is divided in three regions: Flanders in the North, Wallonia in the South, and Brussels in the centre. For each municipality there are only two Electronic Communication Networks (ECNs) that transmit both internet and television.

Figure 3.1: Network coverage of cable operators in Belgium



Source: Institut Belge des Services Postaux et Télécommunications, 2018

[16] In Belgium, for the broadband market there is only one competent NRA (BIPT). However, for media markets, each linguistic community – Flemish, French and German – has its specific NRA. The media NRA for Brussels, given that it is a bilingual city/region, is BIPT. For decisions concerning the media markets, the four NRAs take decisions together regrouped in the CRC.

The incumbent operator, historically owned by the State, is Proximus which covers the whole country. Its network is fibre and copper made, and recently it has started to replace the last copper segments with optic fibre. Figure 3.1 pictures in each municipality the network of the cable operators, Telenet in orange, and VOO in violet. The two do not overlap, meaning that each municipality is covered by Proximus and by one of the two cable operators. Operating at the national level there is also Orange, a virtual operator that is able to offer internet and television using the wholesale offers of the cable operators. While Proximus, Telenet, and VOO are vertically integrated companies with considerably high market shares for each covered zone, Orange is still a minor player in the broadband and television market, given also that it started to offer these services only by 2016 (CRC, 2018). There are also other virtual operators, but given their low shares they can be left out of the picture for this analysis.

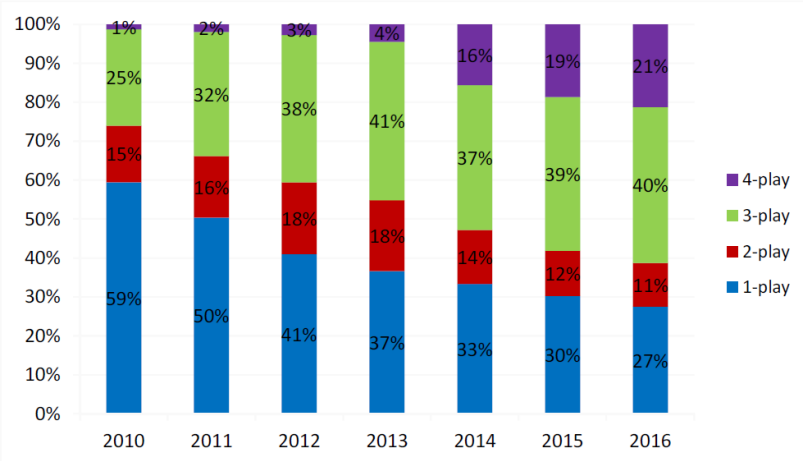
3.2. Belgian audiovisual market

3.2.1. Available offers

In Belgium there are several companies active in the audiovisual market. For the purpose of this thesis I will only list the offers available from the three principal traditional broadcasters (analogue television offers will be left out given that they are difficult to compare with respect to new systems of provision that are more interactive and deliver contents with higher quality), and from the most used SVOD OTTs. The aim of this section is to give an overall panorama of what is offered to Belgian consumers, and to compare the different services' prices.

Proximus offers digital television through its IPTV platform. Contents are delivered via its managed copper and fibre network. Cable operators instead deliver their contents through their coaxial network. In terms of quality and programs, the offers of the four traditional operators are similar and comparable. It must be pointed out that the Belgian market is highly characterized by bundled offers. Indeed, the majority of Belgian users have a television subscription included in a bundle (see figure 3.2).

Figure 3.2: % of television subscriptions in a bundled offer



Source: Institut Belge des Services Postaux et Télécommunications, 2018

While cable operators have standalone television offers, Proximus and Orange do not. This is not a problem since, to be able to compare this offer with SVOD OTTs, it is necessary to take into account at least internet access. In fact, to have access to the online video platforms, customers must have an internet connection (usually a fixed one). Thus, it is appropriate to compare operators' bundles comprising television and internet, with SVOD OTTs plus an internet connection (given that Proximus is the only national player offering an internet only offer and that the other two operators have very similar pricing, the offer of the historical operator will be taken into account for price comparison). However Orange does not offer a dual-play offer television plus internet, so its offer will not be considered. Moreover, only bundles containing at least 200 GB of monthly internet consumption will be taken into account. The Belgian NRAs have stated in their 2018 market analysis (CRC, 2018) that in average a Belgian viewer would need at least 158GB of download capacity in order to watch the same amount of television through their internet connection. Using the same rationale, only SVOD OTTs delivering HD quality will be considered. Hereafter, the list of all possible offers in the Belgian market that respect the aforementioned characteristics[17].

[17] The list of offers and prices are taken directly from the operators' websites visited in August 2018. Rebates, decoder rent and installation fees are not taken into account.

Table 3.1: List of comparable offers in Belgium

Operator	**Name of the offer**	**Download capacity**	**Type**	**Monthly price (in €)**
Proximus	Internet + TV	Unlimited	Linear IPTV	59,00
Telenet	Internet Fibre 100 + TV	200 GB	Linear cable	69,40
Telenet	Internet Fibre 200 + TV	Unlimited	Linear cable	91,90
VOO	Toudoo	200 GB	Linear cable	48,45
VOO	Wahoo	Unlimited	Linear cable	55,45
VOO	Tatoo	Unlimited	Linear cable	77,45
Stievie	Premium	Unlimited	Linear OTT	59,98 (9,99)*
Netflix	Standard	Unlimited	Non-Linear OTT	60,98 (10,99)*
Netflix	Premium	Unlimited	Non-Linear OTT	63,98 (13,99)*
Amazon	Prime Video	Unlimited	Non-Linear OTT	55,98 (5,99)*
BeTV	BeTVGo	Unlimited	Non-Linear and linear OTT	74,98 (24,99)*

*In brackets the cost of the OTT SVOD without the cost of the internet subscription.

From the table 3.1 it is clear that bundles are an effective way to contrast the low prices of SVOD OTTs. In fact, surprisingly, the cheapest subscription is offered by VOO with “Toudoo”. It is often said that OTTs offer subscription prices that are lower than traditional television broadcasters (European Audiovisual Observatory, 2018), but internet connections and the role of bundles are not always taken into account. Moreover, this table is only showing dual-play bundles. If we considered triple-play or quadruple-play bundles, operators’ offers would become even more attractive, in terms of price, with respect to a combination of a bundle without television and a SVOD OTT.

If operators do really consider OTTs as a serious threat to their business, probably it is not because of their price setting, but for other dimensions introduced by the new actors, such as premium and original audiovisual contents, portability, user friendly interfaces, easiness to subscribe and unsubscribe, and so on and so forth.

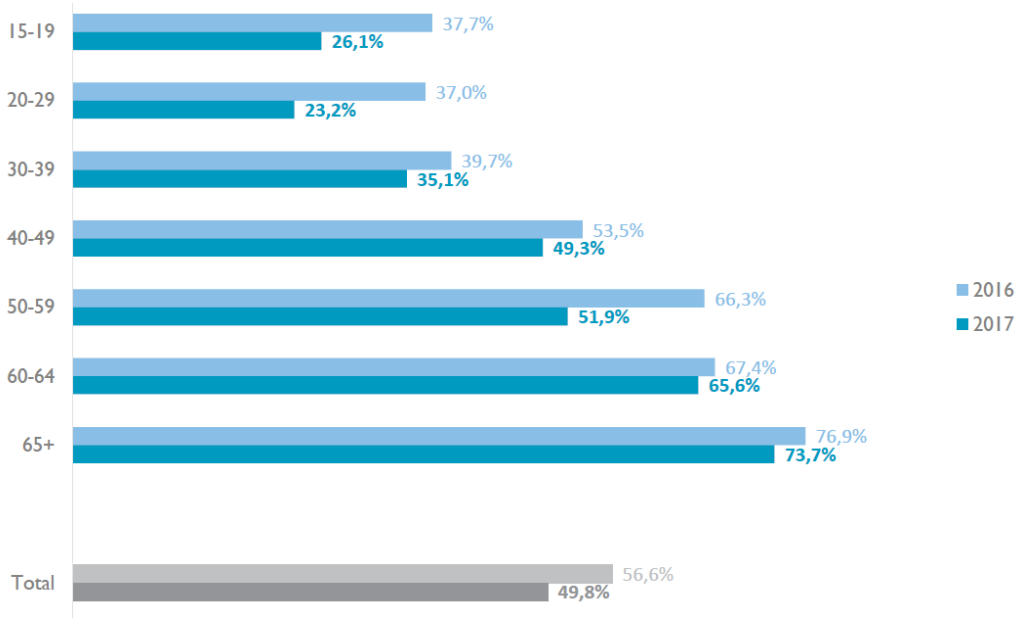
3.2.2. Belgian viewers consumption habits

Similar to the rest of other European citizens, Belgians' audiovisual consumptions habits are changing due to the development of internet infrastructures and video platforms. The revolution was accelerated by the development of personal electronic devices, such as laptops, smartphones and tablets that enable users to watch audiovisual contents online wherever they have access to internet.

In section 1.2.1 I have presented an overview over new consumption habits based on a survey made in United Kingdom about consumers' perception of linear and non-linear audiovisual services. Similar changes are taking place in Belgium. This section is based on the Digimeter study (Imec, 2017), analysing the behaviour of digital customers in Flanders.

Similar to the United Kingdom case, linear television is preferred by older people, while it is becoming less and less watched by youngsters. In general, from 2016 to 2017, all Flemish group ages watched less linear television. On a daily basis, total live television watching fell from 56,6% to 49,8% of the population, as shown in figure 3.3.

Figure 3.3: Watching live TV on a daily basis – split by age group

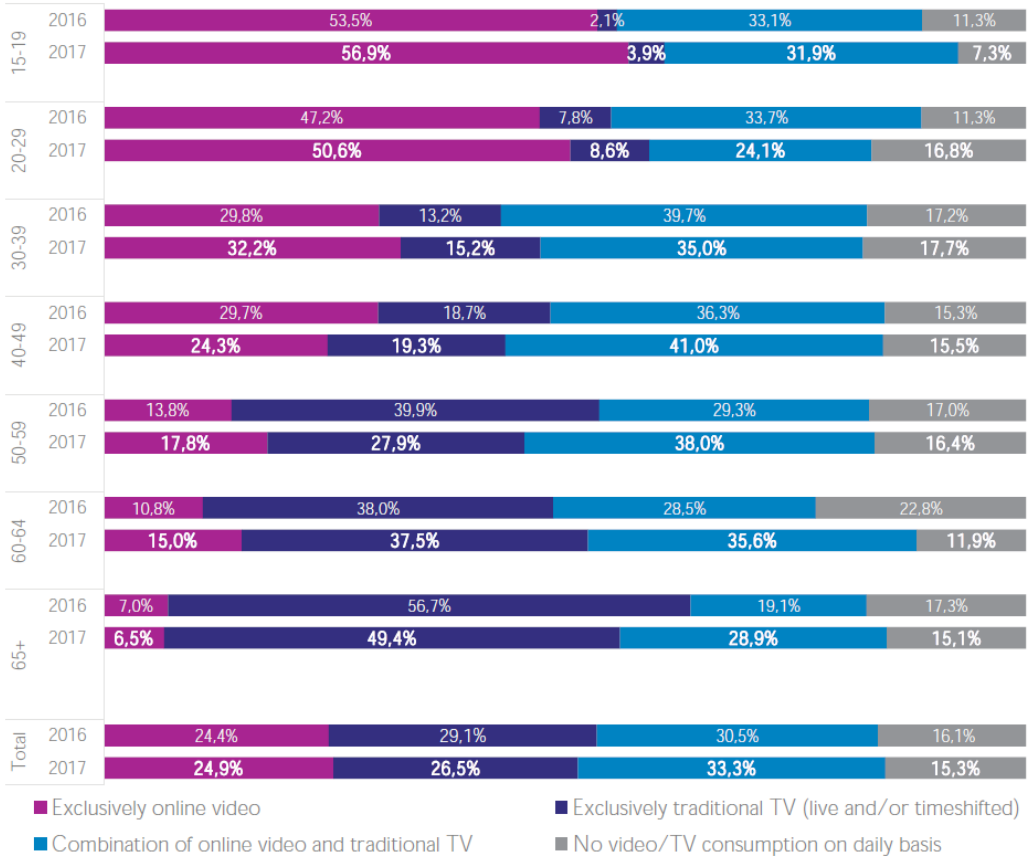


Source: IMEC, 2017

On the other hand, as expected, non-linear audiovisual contents are more popular among younger groups. Looking at figure 3.4, in 2017, more than half of the 15-19 and 20-29 years old watched

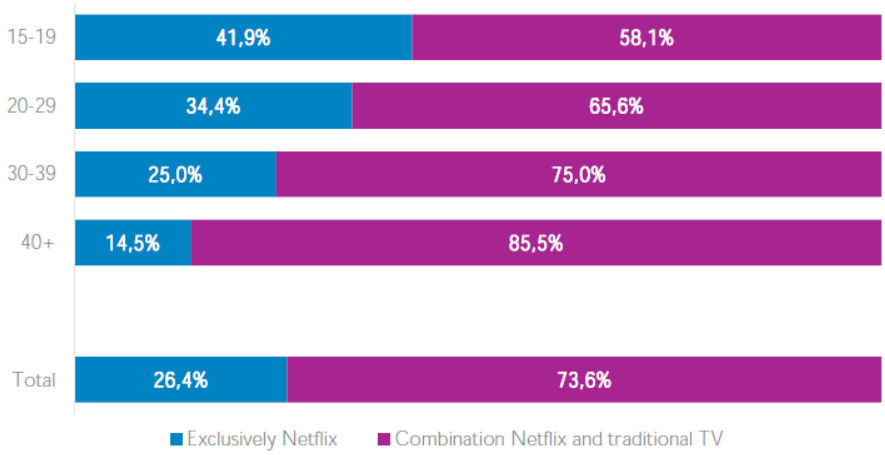
audiovisual contents exclusively via online platforms. Age and "exclusively online watching" seems negatively related. However, Flemish population from 30 to 64 is the one that mostly combine the two types of watching (from 35% to 41% of the population). Focusing only on Netflix consumption (figure 3.5), these trends are confirmed. Younger populations seems to consider the online service as a substitute to traditional television rather than a complement, while older populations perceive them as complement to live television.

Figure 3.4: Watching traditional TV versus online video on a daily basis – split by age



Source: IMEC, 2017

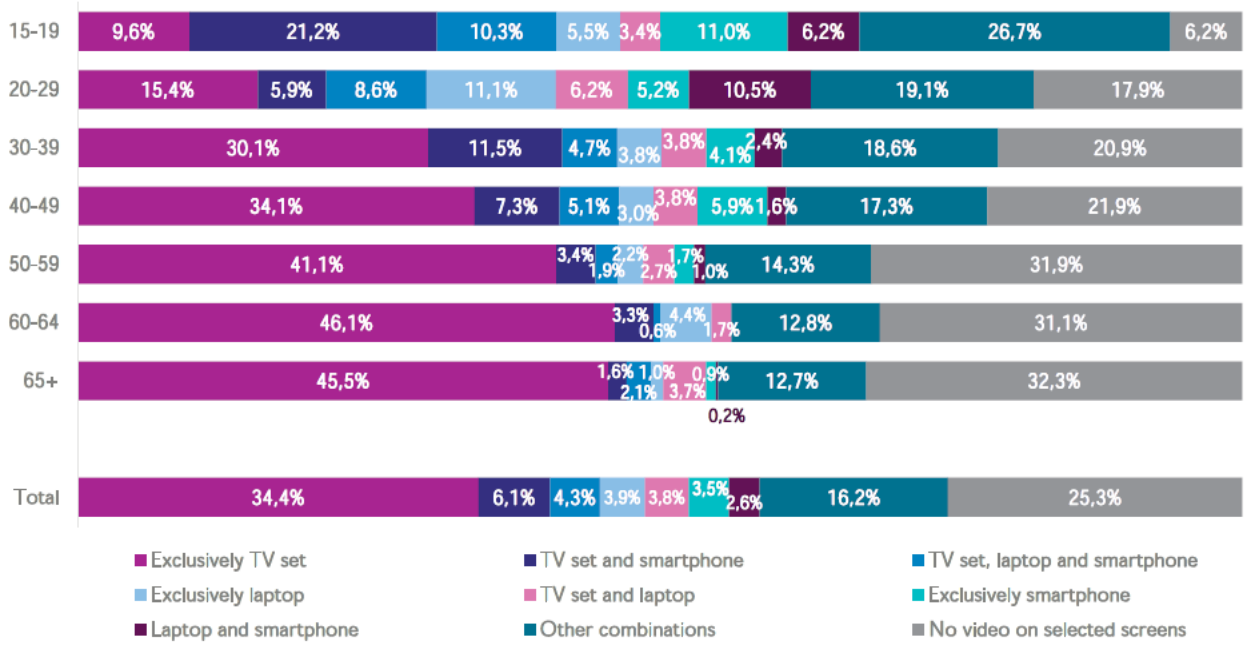
Figure 3.5: Netflix: substitute or addition to watching TV content (weekly basis) – split by age



Source: IMEC, 2017

Flemish are also similar to UK citizens with trends involving the devices used for audiovisual consumption. Older people seem to still prefer to watch programs exclusively through their television set. Instead, younger people, given their higher familiarity with new technologies, are capable to combine more easily multiple devices. Respectively, the percentage of people aged from 15 to 19 and from 20 to 29 that exclusively uses a television set is 9,6% and 15,4%.

Figure 3.6: Combinations of screens used on a daily basis to watch video content – split by age



Source: IMEC, 2017

3.3. The 2018 market analysis

In 2017 the Belgian NRAs started a market analysis for broadband and television that was achieved in 2018. While the two wholesale access broadband markets (local – 3a, and central – 3b) are present in the 2014 Recommendation as markets susceptible to ex ante regulation, the television is not retained anymore. In fact, television was listed in the 2003 Recommendation as market 18 (Broadcasting transmission services), but was eliminated in the 2007 Recommendation. However, the 2014 Recommendation states that it is possible to regulate markets not listed if the three criteria test is fulfilled.

The three criteria are the following: (i) presence of high and non-transitory structural, legal or regulatory barriers to entry, (ii) the market structure does not tend towards effective competition within the relevant time horizon, (iii) competition law is insufficient to address market failures.

In the market analysis, the Belgian NRAs considered that the three criteria were fulfilled, thus the wholesale television market is regulated and an obligation of access to the broadcast network is imposed over the cable operators, i.e. an operator can use the cable network against a payment in order to deliver audiovisual contents to its customers.

3.3.1. Substitutability analysis between linear and non-linear AVMS by the Belgian NRAs

Regarding the television market, the NRAs engaged first in a retail market analysis. They started defining the relevant audiovisual market by assessing whether linear and non-linear AVMS are substitutes from both a demand and supply perspective. As mentioned before, the European jurisprudence has not given yet a clear answer on this matter.

Considering technical characteristics, the NRAs suggest that the two types differ because, vertically integrated operators broadcasting linear television are able to guarantee signal quality by reserving frequencies in their networks, whilst online non-linear service providers are not capable to do the same. However, the NRAs recognize that online platforms currently offer an image quality similar to their traditional counterparts. Moreover, the CRC points out that the non-linear viewing implies a more active behaviour than live television. Given that contents are offered through a vast catalogue,

consumers must spend more time choosing what to watch. As opposed to this behaviour, linear viewing engenders a more passive behaviour, since the contents have been already scheduled by the broadcaster (Kantar Media, 2016).

From the take-up rates of linear and non-linear viewing, even if it is clear that non-linear audiovisual contents are becoming more and more popular, live television is still the dominant way to watch movies and shows. Moreover, based on four different studies[18], the Belgian NRAs point out that non-linear viewing is perceived by the overall population as a complement to live television, rather than a substitute. The CRC concludes that, from a demand point of view, linear and non-linear viewing are complements, and not substitutes.

From a supply point of view, the Belgian NRAs consider that for a non-linear operator, to transform its offer to a linear one would need to drastically change how the contents are provided by creating a schedule, and by changing its pricing. Moreover, without regulation the non-linear broadcaster would not be able to deliver its contents because it would have to replicate the physical network, which is not feasible in terms of time and money. Furthermore, if the non-linear operator would like to offer live contents online, the CRC considers that it would incur problems regarding the guaranteeing of signal's quality and congestions of the broadband network. Thus, the Belgian NRAs conclude that also from a supply point of view, the two types of viewing are not substitutes.

3.3.2. Substitutability analysis between traditional television and audiovisual OTTs by the Belgian NRAs

The study carried an analysis concerning the substitutability between linear traditional television and linear subscription OTTs. Given the very small take-up of the latter service, the CRC does not consider the two as substitutes from a demand point of view. This is also the case from a supply point of view, for the same reasons mentioned in the paragraph before.

During the public consultation, different operators asked the Regulators to include audiovisual OTTs in the relevant market. Some traditional broadcasters have argued that these video platforms are

[18] The CRC based its decision over the following studies: Digimeter (2017), MediaXperience (2016), Profacts (2016), Tera (2016)

competing for the same audience as theirs. Even though at present the take-up rates are low, OTTs could in the near future exert competitive constraints to traditional broadcasters, given their rapid growth in the market.

The Belgian NRAs confirms that audiovisual (SVOD) OTTs cannot be inserted in the same relevant market. The CRC states that the complementary aspect of these services is confirmed also by the partnerships that have been put in place between incumbent operators and online platforms. For example, Proximus signed a partnership with Netflix and put the OTT application in their IPTV platform. Furthermore, the Belgian NRAs point out that despite the continued rise in subscription prices of TV operators, users did not migrate towards OTTs offers. On the contrary, the number of subscriptions to traditional television has not shrunk.

3.3.3. Conclusion of the analysis

The CRC established that the television retail market is highly concentrated in each region. Proximus, VOO and Telenet have considerable high market shares, with other operators possessing market shares under 1%, even though prices are high and have not decreased over the years. Moreover, barriers to entry are high enough to deter entry of new broadcasting operators. It is difficult, if not impossible, to replicate the incumbents' networks because of high sunk costs. Incumbents have also a high competitive advantage because of their scale economies, vertical integration and bundled offers. Moreover, the competitive impact of other delivery platforms, such as OTTs, is none. For these reasons, the television wholesale market must be regulated and, among others, an access obligation was imposed to the incumbent operators' network.

The CRC also states that it will monitor the change in the retail audiovisual market and take into consideration the evolution of the penetration of OTTs platforms. The Belgian case is interesting because if substitutability was found in the retail market between traditional television and audiovisual OTTs, the latter should be included in the relevant market. In that case, the wholesale market could be deregulated in the future when audiovisual OTTs gain enough market shares to prevent any operator to be identified as having Significant Market Power (SMP). As a consequence, the regulatory framework of the Belgian audiovisual market would drastically change leading probably to the exit of virtual operators relying on the current access obligation.

4. Product market definition

In this chapter I will present theories and models used to assess the substitutability between products or services, and identify the relevant market. In the light of the previous sections, it is interesting to introduce the tools and methods that might be used by regulatory authorities to empirically analyse the substitutability between traditional television and SVOD OTTs. The identification of the relevant market has important implications. Considering the Belgian case, as I explained in the previous section, if substitutability were found between traditional television and SVOD OTTs, the regulatory framework and the competitive structure of the market would drastically change.

First, I will present the SSNIP test. Second, I will explain the discrete choice method used to calculate price elasticities. Third, I will discuss the role of price differences in assessing the substitutability of two services. Fourth, I will argue about the appropriateness of using the methods presented to assess substitutability between traditional television and SVOD OTTs, in particular considering the Belgian case. Finally, I will present several alternative studies that have analysed the substitutability between the two audiovisual services.

4.1. Substitutability test

4.1.1. The SSNIP Test

First thing first, we must define what substitutability is. A good is considered as a substitute to another if a change in its price translates into a replacement of the used good (Snyder and Nicholson, 2010). For example, hamburger and hot dogs could be considered substitutes since they satisfy the same needs (hunger, portability, rapidity of preparation and consumption) and have similar characteristics (price, meat and bread as ingredients).

To assess whether audiovisual OTTs and traditional television broadcaster are competing for the same retail market, it is essential to define the relevant market, i.e. a series of interchangeable products that apply competitive constraints on each other (Motta, 2009). The definition of the relevant market serves to draw the legal boundaries in which it is possible to apply competition law. The US Department of Justice has introduced in the 1982 Merger Guidelines a powerful test called Small but Significant Non-

transitory Increase in Prices (SSNIP) able to define the smallest relevant market of a product. This method goes also under the name of Hypothetical Monopolist. The aim of the test is to assess whether it is profitable for a hypothetical monopolist to increase the price of a product by 5-10%. If it is, it means that other products are not substitutable enough, i.e. the competitive constraint exerted by other products is low or null. If the hypothetical monopolist does not find profitable to rise the product's price, the relevant market must be widened by including other goods or services that exert competitive constraints.

Substitutability may be found at the demand or supply level. Demand substitutability is analysed considering consumers' behaviour. If the products or services considered are perceived as belonging to the same group, then substitutability is found. The same reasoning can be applied to the supply side. Competition law gives more importance to the demand level. In fact, if substitutability is found at the demand level, it will not be necessary to run an analysis at the supply level. Vice versa, if substitutability is not found on the demand side, then an assessment must be done at the supply level (2014 Recommendation).

Various factors should be considered in the assessment of supply substitutability. First of all, the supplier of a good that was not previously considered in the market must be in condition to change production rapidly (at most six months or one year), easily, and without incurring major costs. In this exercise, the possibility to overcome barriers to entry should be considered. The nature of these barriers could be legal, technological, and reputational, or due to high sunk costs.

Price obviously plays a major role when defining the relevant market. In sectors distinguished by market power, the current price could be well above competitive prices. Thus, a SSNIP test could lead to wrongly narrowing the relevant market: for instance by offering prices above competitive levels, an increase of 5-10% could indicate non-profitability of the hypothetical monopolist. Therefore if competitive prices were used in the assessment, the relevant market would be wider (Schaerr, 1985). This problem goes by the name of "cellophane fallacy", from the well-known *du Pont*[19] case.

By applying the SSNIP test, the major problem lies with the absence of data, given that the test is based on a hypothetical monopoly situation. Some tools have been developed and I will review them in the

[19]See United States v. E.I. du Pont de Nemours & Co., 351 U.S. 377 (1956)

following paragraphs. In order to implement the SSNIP test, the first quantity to find is the own-price elasticity of market demand, which is defined as the measure of responsiveness of demand following a one-percent increase in the price of a product (Motta, 2009). In formulas it is expressed (in discrete terms) as follows:

$$\varepsilon = -\frac{\Delta Q/Q}{\Delta P/P}$$

where P and Q are respectively the price and quantity of the product and Δ represents their variation. As a consequence, the higher the elasticity ε, the higher the chances that the product under examination is in the same relevant market as at least another product. By knowing all the quantities and corresponding prices it is possible to assess how the profitability of the hypothetical monopolist will be affected. For example, if the difference in revenues is positive, then we have a preliminary hint that the market must be widened. We can define the difference in revenues as:

$$\Delta R = R_1 - R_0 = P_1 Q_1 - P_0 Q_0$$

where R_1 and R_0 are respectively the revenues after and before the increase in price. By rearranging the terms and dividing by R_0 we obtain:

$$\Delta R/R_0 = (1 + \Delta P/P_0)(\Delta Q/Q_0) + \Delta P/P_0$$

Despite the simplicity of the calculation, it is important to point out that, *ceteris paribus*, this method is not sufficient to define the relevant market. As a matter of fact, other variables could affect the demand of the product, such as the price and the availability of other products. In order to obtain a better and more robust estimate of elasticity, it is necessary to create an econometric model that takes into account different significant control variables. Moreover, one must also consider that changes in consumers' behaviour reacting at price increases take time and depends on the market under examination.

Another useful information that helps define the relevant market is cross-price elasticity (ε_{AB}). When the own-price elasticity is relatively high, other products could exert a competitive constraint on the product analysed. Therefore, cross-price elasticities, defined as the responsiveness of demand for product B following a one-percent increase of product A's price (Motta, 2009), must be estimated in

order to identify to which products the demand is diverted. In formulas it is expressed (in discrete terms) as follows:

$$\varepsilon_{AB} = (\Delta Q_B / Q_b)/(\Delta P_A / P_A)$$

A high cross-price elasticity will indicate that product B is a close substitute of product A and the two should be considered in the same relevant market.

4.1.2. Calculating elasticities: the discrete choice method

In order to have robust elasticities estimates it is suggested to make use of econometric models based on data taken from surveys of the population. Elasticities can be obtained directly from surveys based on stated-preference data, where respondents have to choose one answer over a group of possible alternatives in a hypothetical situation. While the advantage of this method is its simplicity, it incurs a major limitation. People's answers in surveys often are different from what they would actually do. Individuals cannot predict exactly how they would behave in real life situations, or they may not be willing to state their real preferences. (Train, 2009).

Another method used in the literature is the so-called revealed-preferences, which reflects actual choices made by respondent. The estimation of elasticities is not based on what the individual declares, but on the made by individuals in real-life situations. The advantage of this method lies in the robustness of the results. As the previous one, this method also incurs some limitations. In fact, the data obtained are based on situations and characteristics currently present or that have historically existed (Train, 2009).

When individuals are faced with choosing different products, one of the most commonly used model is the multinomial logit, which allows to evaluate the probability associated with the consumer's choice for each product belonging to a set of possible alternatives and taking into consideration other control variables.

Let us consider a set of possible choices C composed by n products that are mutually exclusive alternatives. The utility function of an individual i consuming a product j is:

$$U_{ij} = \alpha_j + \beta p_j + e_{ij}$$

Where α_j is the product j specific constant, p_j is its specific price, β is the coefficient of the price, and e_{ij} is the random component or residual specific for the product j and individual i. It is important to point out that a negative correlation between price and utility is assumed, so in the end the resulting sign should be a minus. The highest the product's price, the lower the utility. Moreover, in this notation the only explanatory variable is price. As mentioned above, other variables consisting in the characteristics of the product and of the population (age, sex, income, family composition, …) must be added.

By maximizing each individual's utility and aggregating them, we obtain the probability that product j will be chosen by the population:

$$\pi_j = \Pr(U_j > U_k) = \Pr(e_{ik} - e_{ij}) < (\alpha_j - \beta p_j) - (\alpha_k - \beta p_k), \quad \text{for all } k \in C, \quad k \neq j$$

Moreover, by assuming that the residuals are independently and identically distributed, one obtains that π_j is distributed following a logistic distribution function (Motta, 2009):

$$\pi_j = \frac{\exp(\alpha_j - \beta p_j)}{\sum_{k \in C} \exp(\alpha_k - \beta p_k)}, \text{ for all } k \in C, \quad k \neq j$$

In order to estimate the two parameters α_j and β, the maximum-likelihood procedures can be applied. If the set C containing all possible alternatives is well defined and control variables are introduced to minimize any possible bias coming from unobserved choice characteristics, then the estimates of α_j and β can be used to identify the own-price and cross-price elasticities of demand, being respectively:

$$\varepsilon_{jj} = \beta p_j (1 - \pi_j)$$

$$\varepsilon_{jk} = \beta p_k \pi_k$$

Another crucial hypothesis in this model is the independence of irrelevant alternatives (IIA). When choosing between two products, the probability of a consumer choosing one or another must not be affected by the availability of another product that was not firstly considered in the set C. If IIA holds, then the cross-price elasticity of two products is always the same. This property can be assessed by a Hausman test. If the estimated coefficients coming from two different sets of alternatives are the same, then IIA holds.

4.1.3. Price differences

When it comes to market definition, one might be tempted to use price levels in order to define the relevant market (Motta, 2009). The European Commission used in several cases[20] differences in price as a proxy to determine that two products are not in the same market. However, differences in price between two products could arise from differences in characteristics, which do not necessarily indicate that the two products are not in the same market. For example, coffee beans showing the label "Fair Trade" are generally more expensive than coffee beans that are not certified. The fact that the former bears a higher price that incorporates a monetary contribute for a sustainable development of coffee beans farmers in southern countries, does not imply that it does not exert a competitive constraint on uncertified coffee beans. On the contrary, most probably they exert competitive constraints on each other and are in the same market.

Several reasons can explain the price difference between two products competing in the same market, for example: brand reputation, entry market strategies, quality and other characteristics of the product. Let us imagine the case of a firm willing to introduce in an already existing market a product that presents a new characteristic. The novelty could be physical or given by the new way of selling, delivering or consuming the product. In a first period, the firm might set a low price in order to capture and create a base of clients. Such strategy is quite common when a firm wants to get clients accustomed to the new feature introduced. In a second time, the firm might be willing to increase the price. After achieving a critical mass of clients such that all the market is aware of the new feature introduced, the new attribute could give the firm some market power and, thus, a rise in price would not translate in a great reduction in demand. This implies that the demand curve for the new product is inelastic, at least under competitive price levels. Another reason for the firm to raise the price in a second time could be given by the intention to invest more in the development of features of the product. In this case, if the utility of the customer increase more than the disutility coming from the rise in price, the number of clients could increase.

As we have seen in the previous section, the discrete choice method can capture, through control variables in the multinomial logit model, the attributes of a product other than the price. This means

[20] See Case No. IV/M053 – Aerospatiale-Alenia/de Havilland or Case No IV/M.984 – Dupont/ICI

that even if products are quite different in terms of prices, what determines the substitutability is given also by how products are used and by consumers' preferences over the product's attributes. However, a great difference in prices could call into question the results of the analysis if the attributes picked as control variables are poorly chosen.

4.1.4. Discussion on a possible application

In the last years, broadcast operators have been complaining about the fact that audiovisual OTTs are competing in their same retail market, but do not incur the same obligations imposed by regulation. They complain that competition is distorted and unfair since regulation is giving an unjustified advantage to OTTs. As we have seen in section 2, current regulation do not consider the two services in the same retail market, even though some adaptation to reduce the differences arising from obligations has been proposed.

To my knowledge, an application of a discrete choice model in order to estimate cross-price elasticities between OTTs video platforms and television subscription has not been made yet. However, given the rapid expansion of the online platforms and the rising concerns coming from television operators, such an analysis could give an answer on whether the two services are in the same relevant market.

The aim of this section is to understand how such an analysis could be implemented and to discuss possible issues. In particular, traditional methods based mainly on price are relevant if price is the main decision variable driving consumers' choice. I will argue if this is the case in the AVMS market.

I could not run an empirical analysis following the insights that will be presented in this section because data is not available and conducting a survey over the Belgian population would have been too expensive. The reference case is the Belgian audiovisual market, presented in chapter 3.

First of all, a set of possible alternatives that respects the hypothesis of irrelevant alternatives (IIA) should be defined. For this purpose, I introduced in section 3.2.1 the offers that should (at least) be considered. It is important to remind that, for comparison and simplicity sake, given the extended usage of bundled offers in Belgium, and the obvious need of an internet connection in order to watch audiovisual OTTs, the offers presented are, for the traditional operators, dual-play bundles containing television and internet, for OTTs, the sum of Proximus' internet only offer and the OTT subscription.

However, as pictured in figure 3.2, the majority of Belgian customers have a triple-play subscription. For a complete study I would suggest to insert all possible combinations considering triple-play bundles (internet, television and fixed line) and comparing them with the OTT subscriptions plus internet and fixed line[21].

Price is usually one of the most important variables, but at the same time it can be misleading. Indeed, price differences can be quite different whether we consider bundles or standalone offers. For the latter, the difference in prices between traditional television and SVOD OTTs can be high.

Table 4.1: Belgian standalone audiovisual offers*

Operator	**Name of the offer**	**Type**	**Monthly price (in €)**
Telenet	Digital TV	Linear cable	17,90
VOO	Digital TV	Linear cable	19,75
Stievie	Premium	Linear OTT	9,99
Netflix	Standard	Non-Linear OTT	10,99
Netflix	Premium	Non-Linear OTT	13,99
Amazon	Prime Video	Non-Linear OTT	5,99
BeTV	BeTVGo	Non-Linear and linear OTT	24,99

* The list of offers and prices are taken directly from the operators' websites visited in August 2018. Rebates, decoder rent and installation fees are not taken into account.

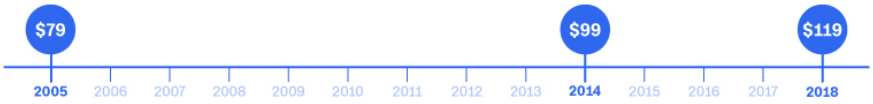
If we do not consider BeTVGo (which appears to be an outlier), the most expensive digital television subscription costs 13,76€ more than the cheapest audiovisual OTT subscription. In other words, it is 3,3 times more expensive. However, an internet connection is needed in order to watch videos online. For this reason, it seems more appropriate to consider bundles comprising (at least) internet and television services.

Price does not seem to play a major role for consumers' decisions in the audiovisual market. Following the arguments presented in section 4.1.3, OTTs have started supplying audiovisual contents at low prices with respect to traditional networks. In the last years these online platforms have already

[21] There are no dual-play offers containing internet and mobile, and quadruple-play cannot be taken into account because there are no triple-play bundles offering internet, mobile and fixed line.

experienced increases in prices. Amazon with its Prime subscription that offers, among other services, its platform Prime Video, already raised two times its price in the United States.

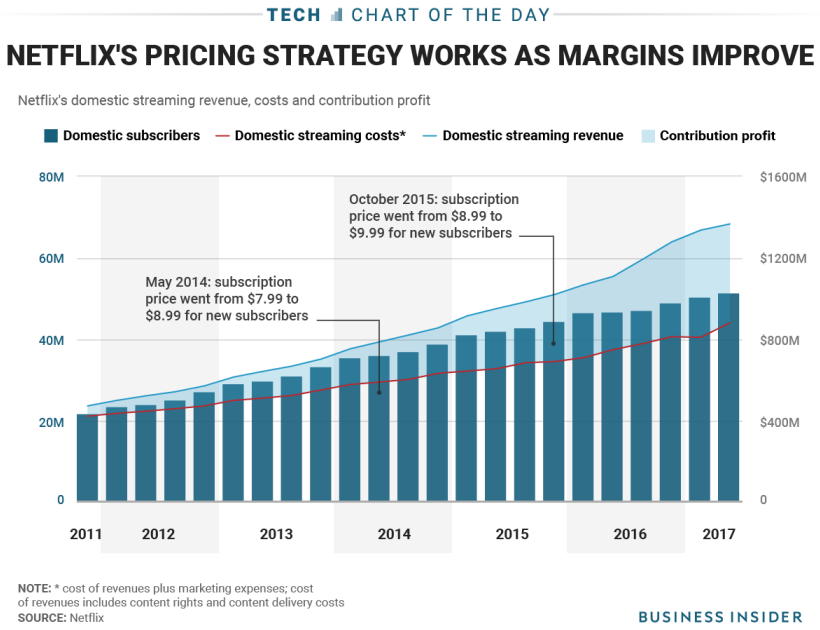
Figure 4.1: Evolution of Amazon Prime price subscription



Source: CNN tech, 2018

It also happened in some European countries, such as Italy, where this year annual subscription raised by 80%, from 19,99 to 36€[22]. The company justified the increase in price because of the improvement of old, and introduction of new, services, or creation of new contents. For example, Amazon announced an investment of 1 billion dollars in the production of a Lord of the Rings television show[23]. Also Netflix, the biggest streaming company in the world, raised its price as shown in figure 4.2.

Figure 4.2: Evolution of Netflix price subscription



Source: Business Insider, 2017

[22] Milano, F. (2018), L'annuncio via mail di Amazon Prime: l'abbonamento raddoppia a 36 euro, *Il sole 24 ore*, press article retrieved from http://www.ilsole24ore.com/art/tecnologie/2018-03-21/amazon-prime-l-abbonamento-sale-36-euro-122105.shtml?uuid=AEKaAeKE

[23] Tassi, P. (2018), Amazon's Potentially Billion Dollar 'Lord of the Rings' Show Sounds Absolutely Insane, *Forbes*, https://www.forbes.com/sites/insertcoin/2018/04/06/amazons-potentially-billion-dollar-lord-of-the-rings-show-sounds-absolutely-insane/

A reduction in level of subscriptions did not follow after these price rises. On the contrary, the two aforementioned companies are continuously growing, and so their customer base. Two possible reasons can explain this fact. First, OTTs have followed a low entry pricing strategy, consistently under the pay-tv prices, in order to build a customer base. After gaining market power, they started lifting prices. Second, OTTs are trying to expand even more their customer base by adding or improving contents in order to capture the different tastes of the population, but also by improving the platform interface, recommendation algorithms and contents delivery. To do so, they need to invest more in the production of contents or acquisition of audiovisual rights, in IT departments, data scientists and high quality servers. Thus, the price increase is justified by a higher viewers' gratification from the improved contents, in terms of quality or quantity. So, the reduction in utility given by the price rise is more than compensated by the client's utility rise coming from the contents' improvement. In the view of what I explained in section 3.2.1., by adding the cost of broadband access to the OTT subscription, differences in price are small with respect to incumbent operators' bundles. Thus, the low entry price argument designed to build a customer base does not seem to be confirmed. Instead the second argument based on higher quality seems validated by how OTTs players are behaving in the market.

Nevertheless, price remains an important variable that can influence individuals' decisions, but it does not seem as important in the audiovisual sector as in other markets (such as the broadband one). This is confirmed by the study in British viewing habits (Karma Media, 2018), and also by the Belgian market analysis (CRC, 2018). Viewers seem to choose online platforms mainly on the basis of contents provided. Moreover, price elasticity (with respect to television subscriptions) found in the Belgian market is really low. Indeed, operators maintained in the last years their high market shares even though subscription prices did not stop to rise (Table 4.2).

Table 4.2: Nominal price evolution of digital television subscription in Belgium

Plans tarifaires	2011	2012	2013	2014	2015	2016	2017	Augmentation tarifaire par rapport à 2011
TV SFR Silver/Numericable TV Plus	20,80	29,90	27,90	39,90	41,15	41,85	42,80	**106 %**
TV SFR Black/Numericable TV Platinum				59,90	61,15	61,15	61,15	
VOO (avec VOObox)	15,25	16,74	18,78	20,25				
VOO (avec VOOCorder)	18,50	21,55	22,95	24,95	26,95	26,95	27,45	**48 %**
VOO (avec box .evasion)					30,95	30,95	31,45	
Telenet (avec HD Digibox)	17,98	17,40	17,95	18,10	18,75	19,05	21,15	**18 %**
Telenet (avec HD Digicorder)	22,40	22,65	23,40	23,70	24,70	25,15	25,90	**16 %**

Source: CRC, 2018

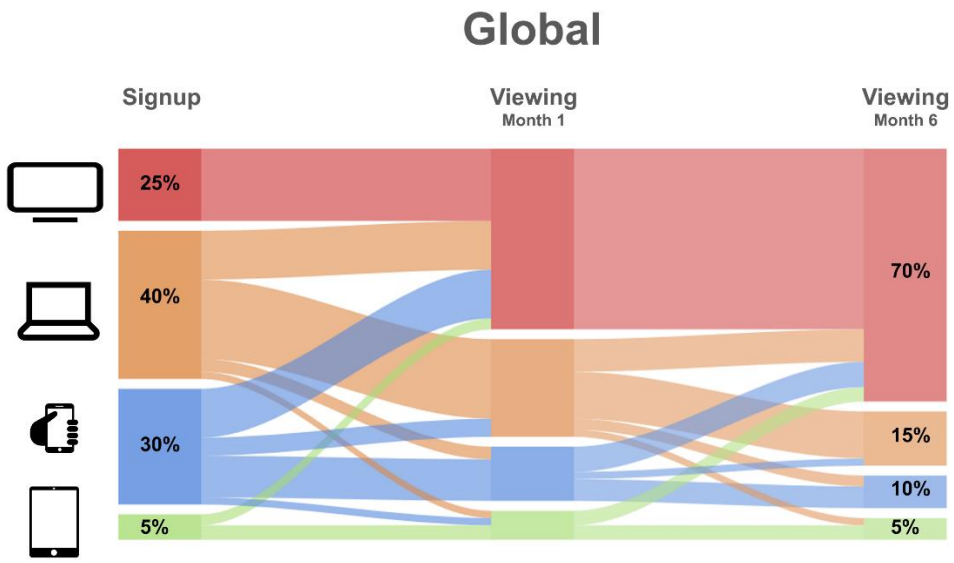
This is problematic since the analytical framework used nowadays from NRAs to study services substitutability highly rely over price. Indeed, in the method described in this chapter, the most crucial question in order to assess price elasticity is: *How would you react to a price increase of 5 or 10% of your monthly subscription?*

Moreover, as pointed out also by the European Parliament in its 2015 report on OTTs, when defining relevant markets, NRAs rely over variables representing "*the means by which services are delivered (or how they are paid for) rather than the nature of the services themselves and how they are perceived by end-users*". Indeed, other variables generally used in these analysis are technical characteristics explaining how services are delivered. For example, one could be tempted to take into account as a control variable the used device(s) to watch audiovisual content, expecting high variation since traditional television is usually watched on television sets, while it is easier to watch SVOD OTTs on multiple devices. However, one can also be disappointed by reality. Even if portability is one of the major feature of online platforms, people of all ages around the world strongly prefer to consume audiovisual contents via their television[24] (figure 4.3). Furthermore, it is really difficult nowadays that a

[24] Kafka, P. (2018), You can watch Netflix on any screen you want, but you're probably watching it on a TV, *Recode*, press article retrieved from https://www.recode.net/2018/3/7/17094610/netflix-70-percent-tv-viewing-statistics

broadcaster does not retransmit its audiovisual contents, live or on-demand, to its customer base through its online platform or application.

Figure 4.3: Devices used to watch Netflix after 6 months



Source: Recode, 2018

It is undeniable that price and deliver characteristics still play a role, but, as mentioned before, the choice of customers in the audiovisual market seems more taste and content driven. Indeed, Netflix's business strategy has consisted into identifying taste communities, i.e. groups of people having similar consumption patterns, and creating or proposing contents able "*to suit their tastes*"[25]. For example, it was reported that Netflix will start producing teenage romantic comedy series since it found that many youngsters would like to watch this kind of content[26].

Given these arguments, the traditional framework used by NRAs does not appear to be particularly appropriate for defining the relevant audiovisual market. Moreover, it seems challenging to identify the right variables able to capture how consumers perceive the nature of the audiovisual services.

[25] Lynch, J. (2018), Netflix Thrives By Programming to 'Taste Communities,' Not Demographics, *AdWeek*, press article retrieved from https://www.adweek.com/tv-video/netflix-thrives-by-programming-to-taste-communities-not-demographics/

[26] Nathoo, Z. (2018), Netflix targets teens with rom coms — a genre that has faded from theatres, *CBC*, press article retrieved from https://www.cbc.ca/news/entertainment/romantic-comedy-returns-netflix-1.4774924

4.2. Alternative studies

The economic literature is not particularly rich in the field of substitutability analysis in the audiovisual market. However, some multidisciplinary attempts were performed using alternative analysis frameworks popular in mass communication or psychology studies. Without going into details, I will present some of these works and their results.

In mass communication, substitutability between two media is assessed considering the use and gratification that the two media can provide to individuals. Thus, it does not only depend on how the content is delivered, but also on how the consumer perceive the content. Individuals select a media to satisfy specific needs. Cha and Chan-Olmsted (2012), using a sample of 1500 US adult internet users, identify six motives for watching audiovisual contents, and class them from the most to the least salient: desire to learn, relaxing entertainment, boredom relief, social interaction, companionship, and escape. Of these motives, two variables were statistically significant in predicting perceived substitutability between traditional television and online video platforms. The two variables are 'desire to learn' and 'relaxing entertainment', and are negatively related with the perceived substitutability between OTTs and traditional television, i.e. the more users watch audiovisual contents for learning or relaxing, the less they find the two services substitutes.

Moreover, Cha and Chan-Olmsted (2012) found that substitutability perception depends also on whether the individual is already a user of online video platforms or not. Indeed, individuals that already have used online video platforms are less likely to perceive the two services as substitutes. Vice versa, non-users of OTTs are more likely to consider the two as substitutes.

Baccarne et al. (2013) confirmed the results of Cha and Chan-Olmsted (2012). Their study analyse the Flemish audiovisual market through a survey conducted over 1269 respondents. Their results show that OTT audiovisual services are rather complements than substitutes of traditional television services. The study concludes that traditional television in Flanders is not threaten by audiovisual OTTs, also because of the market dominance by the two main operators (Telenet and Proximus) enjoy and the high take-up rate of triple-play bundles.

Another study conducted in Korea confirmed the complementary nature of audiovisual OTTs. Kim et al. (2016) adapted the niche theory in order to study the competitive environment of audiovisual markets

In this context, by niche the researcher means the set of dimensions that motivate individuals to consume audiovisual contents, which a company tries to satisfy entirely or specializing in some of them. These dimensions are very similar to the one used by Cha and Chan-Olmsted (2012), but Kim et al. (2016) also inserted variables that capture price and easiness to use the audiovisual service. When a new medium appear in the market, it is possible that it enters in competition with other firms in some or all consumers' gratification dimensions. The two can compete, trying to eliminate each other, or they can differentiate themselves in order to coexist.

To understand if traditional television and OTTs are competing for the same gratification dimensions, Kim et al. (2016) use a measure called niche overlap. The latter measures if two media are trying to satisfy the same viewers' needs. A high niche overlap between two media indicates that the two are competing for the same dimensions, thus are substitutes. Instead, a low niche overlap indicates that the two media differentiated themselves and are satisfying different needs, thus they are complements. The results showed that the overlap between pay-tv broadcasters is high. The same applies between OTTs platforms. However, niche overlap between traditional television and OTTs platforms is low, suggesting that the two are complements.

These studies are some of the few first quantitative attempts trying to understand the degree of substitutability between traditional television and audiovisual OTTs. The most important point to retain are not the results (that depend on timing, methodology and country), rather the framework and variables used to analyse the problem that could inspire some updates for the traditional and current framework used by NRAs to identify the relevant market.

5. Competition and the net neutrality debate

The structure of digital markets is a further aspect that regulatory authorities should take into account when analysing competition issues concerning digital services. Firms in these markets are often two-sided platforms, and the relationship between them are frequently characterized by network effects. Traditional tools used to assess substitutability do not seem to consider these characteristics, thus they could be inappropriate. Moreover, it is impossible to overlook the role of ISPs when assessing the substitutability of television and SVOD OTTs. ISPs, alongside internet, offer other services such as telephone and television that can be in competition with the services offered by the OTT. I showed in the previous chapter that (currently) the relationship between SVOD OTTs and traditional television seems to be complementary. However, if substitutability were to be found, the ISP offering also a television service could be tempted to exclude or discriminate the OTT competitor.

In this chapter I will clarify competition issues in digital markets linked to net neutrality. First, I will shed light on the structure of digital market by explaining the concept of two-sided platform. Second, I will present the net neutrality debate and the opposing views on this matter. Third, I will show the economic, regulatory and competition implications of imposing or lifting net neutrality.

5.1. Platforms and net neutrality

As we have seen in the first chapter, the internet value chain is composed by different actors. The most prominent one is the ISP which relies end-user to contents providers. On one side, the interest of internet users in having their broadband connection depends only on the contents and services they can access over the internet. On the other, CAPs are interested in using internet in order to have access to consumers. Both sides evaluate internet access on the basis of the presence of the other side. This interaction between buyers and sellers through the ISP creates economic value (Rochet and Tirole, 2003).

Internet access exhibits network effects that can be direct or indirect. There are direct network effects if users' utility increases by the number of users present on the same platform. A classic example are telephones. The more people have a telephone, the more interesting is to buy one in order to communicate with others. There are indirect network effects if users' utility increases with the number of sellers (or contents) present in the other side of the market. In this case users do not care on the

participation of other users. Vice versa, the bigger the customer base of a platform, the higher the interest of a CAP to use it. A classic example is an app store. The more users use the app, the more developers are interested in selling their products through it. Indirect network effects are the one that characterize two-sided platforms, i.e. platforms in which the two sides care for the participation of the other (Belleflamme and Peitz, 2015). ISPs can be considered as two-sided platforms connecting CAPs and users.

SVOD OTTs can also be considered as platforms exhibiting indirect network effects, positive in both sides. These online platforms work as contents aggregators, connecting producers of movies and shows to viewers. The indirect network effect is present since users are attracted by SVOD OTTs with larger catalogues. At the same time, producers are more willing to sell their contents to platforms with larger customer bases. Some SVOD OTTs, such as Prime Video and Netflix, behave also as contents providers by presenting in their catalogues contents that they produce themselves (Peitz et al., 2014).

The audiovisual market is multi-layered, and its structure is not straightforward. The traditional actor is the broadcast operator using its network to convey contents (produced or bought) to viewers. New actors, such as SVOD OTTs, deliver contents by free-riding the internet and they (usually) do not own the broadband infrastructure. The latter is normally owned by the traditional broadcaster, which uses its own infrastructure to sell different services including television and internet.

This structure engenders three major problems regarding the ISP selling also a television service. First, depending on the substitutability between the audiovisual content offered by the incumbent and the OTT, the latter could be "stealing" viewers and revenues from the former. Second, depending also by the technology used by the incumbent, audiovisual OTTs could create congestion problems over the infrastructure. In fact, internet video traffic has incredibly grown and it is expected to reach (globally) 82% of all internet traffic by 2021[27]. Online video consumption can put high pressure on the network capacity, impeding other contents to be delivered or lowering the quality of the signals if the infrastructure is completely congested, reducing the value of the ISP access offers (Peitz et al., 2014). In 2011, Canadian broadband networks suffered from high congestion, due also to the incredible

[27] Cisco (2017), Cisco Visual Networking Index: Forecast and Methodology, 2016–2021, retrieved from https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/complete-white-paper-c11-481360.html#_Toc484813985

success of Netflix. The American company, in order to avoid problems and costs, had to compress data consumption. Before the compression took place, 30 hours of streaming corresponded to 31 GB, after the scaling down it was equal to 9 GB[28]. Third, due to the higher consumption of internet services, ISPs are forced to invest in new costly infrastructures. However, due to the two aforementioned issues, the incentives to invest in network upgrades are low (Peitz et al., 2014).

The net neutrality debate revolves around the revenue, congestion and investment problems. Members from the academic, political and telecommunication worlds asked to give the possibility to ISPs to manage their web traffic by, for example, pricing the access of CAPs to the infrastructure.

Net neutrality is a principle that imposes ISPs to not discriminate types of services and to not allow network traffic management techniques. In other words, "all bits are equal" (Leal, 2014).

Net neutrality is a broad concept that encompasses different economic meanings. Net neutrality can (i) forbid ISPs to price access on the CAP side, (ii) impede the prioritization of certain CAPs, (iii) forbid the non-price discrimination of certain CAPs, and (iv) impede the exclusion of CAPs (Peitz et al., 2014).

The first meaning is straightforward. CAPs do not have to pay ISPs in order to have access to their infrastructure. The second type does not give the permission to ISPs to manage the data traffic in their network. For example, an ISP selling also VOD contents online cannot give priority to its service over other streaming platforms. The third type consists in using other non-price instruments in order to impede or slow down certain contents providers, such as throttling, i.e. the intentional slowing of an online service done by the ISP. In 2007 Comcast, one of the largest ISP in the USA, was accused of throttling Bit-Torrent's traffic, the famous peer-to-peer sharing platform (Greenstein et al., 2016). The fourth type consists in a vertical foreclosure, i.e. the ISP blocks the access to end-users to a determined CAP. For example, in 2010 a Dutch ISP blocked the access to Skype and WhatsApp, and consumers could access these OTTs only by paying an extra fee (Broos and Gautier, 2017).

Net neutrality still is a hot topic. "Openists" support net neutrality because discrimination could harm the development of new online services. Given the impact of the digital economy in the life of everyone,

[28] Sharp, A. (2011), Netflix cuts data use on Canada online service, Reuters, press article retrieved from https://www.reuters.com/article/us-netflix-canada/netflix-cuts-data-use-on-canada-online-service-idUSTRE72S3BT20110330

limiting innovation would be harmful for society. "Deregulationists" support the idea that ISPs should be able to manage internet traffic addressing the revenue, congestion and investment problems mentioned before. The academic world is also unclear on whether net neutrality is economically and socially desirable (Peitz et al., 2014).

However, the political world decided to take a clear stance. In 2015 the European Parliament adopted Regulation 2015/2120 imposing net neutrality. ISPs cannot engage in blocking, throttling or discriminating any kind of online service. However, ISPs can manage or block the network traffic when it is in compliance with legal obligations, in order to preserve the integrity of the network, and in exceptional and temporary situations because of congestion problems. In the same year, under the Obama administration, net neutrality was enforced by the Federal Communications Commission (FCC) with the rule on "Protecting and Promoting the Open Internet". However, in 2018, under Trump administration, net neutrality rule was repealed[29].

5.2. Net neutrality: economic and regulatory implications

In Peitz and Valletti (2015), scholars point out that the current analytical framework using the hypothetical monopolist test, for defining the relevant market, does not fit well and need adaptation in markets characterized by indirect network effects and two-sided platforms.

The relationship between infrastructure and contents is complementary. In order to be able to access contents online, users must have access to broadband. Economic inefficiencies due to pricing externalities can arise when entities enjoying market power set the price independently. This could be the case in the digital market, given the structure of the internet value chain. In Peitz and Valletti (2015), scholars show that when net neutrality is enforced and an OTT enter the market, a double marginalization problem[30] appears. This leads to lower revenues for the ISP, lower incentives to invest in the infrastructure, higher prices and lower social outcomes.

[29] White, J. (2018), Net neutrality rules officially repealed in the United States, Independent UK, press article retrieved from https://www.independent.co.uk/news/world/americas/net-neutrality-us-repeal-takes-effect-what-changes-ajit-pai-discharge-petition-a8394266.html

[30] In a market characterized by firms operating on different levels of the supply chain, retail prices are higher than if the activity was done only by one vertically integrated firm. The upstream firm will apply a margin in its wholesale price and the downstream firm will do the same. This is the result of not being able to internalize price externalities (Belleflamme and Peitz, 2015).

Conversely, when net neutrality is not enforced, and the ISPs are able to put a price over access to both end-users and OTTs sides, an ISP enjoying market power is able to manage and internalize indirect external effects. Moreover, the price set on one side depends on the intensity of the externality exerted on the other side. The higher the indirect network effect, the lower the price. In other words, the side that cares more about the other will pay relatively more. Another example also present in Peitz and Valletti (2015), demonstrates that the price set by a monopolist ISP on each side is aligned with the socially optimum one, and is lower with respect to the price set by a monopolist ISP in a net neutrality context.

Given the high presence of OTTs, it is possible that by removing pricing restrictions, the user side would enjoy lower prices, while the OTTs would be charged relatively more. However, in a context where there are several ISPs present in the market, the social optimum pricing could not be reached. ISPs would be too focused on the user side, charging them low prices, while OTTs would be overcharged with high mark-ups, hindering CAPs availability[31] (Peitz and Valletti, 2015).

Regarding prioritizing access, giving ISPs the possibility to manage traffic when the network risk congestion issues can be improving in terms of social welfare. Some contents, such as online videos, are time-sensitive, meaning that their quality can suffer from delays. Conversely, less-time-sensitive contents, such as email or web browsing, are those for which quality do not decrease with delays (Peitz and Schuett, 2016). A discriminatory regime that enables ISPs to create priority lanes for time-sensitive contents can impact the behaviour of CAPs and ISPs. CAPs would be motivated to adjust their data volumes by investing in compression technologies, while ISPs can extract extra revenues from the priority lanes and use it to invest in infrastructure upgrades. CAPs that are not interested to pay for prioritization would instead receive a best-effort treatment (Peitz et al., 2014).

As mentioned at the beginning of this section, since the actors in digital markets are multi-sided platforms, a SSNIP test assessment done only on one side of the market would not take into account the indirect externalities and complementarities of the market structure. When applying the hypothetical monopolist test, in which side should the price rise take place? Given the indirect externalities, should the difference in revenues be assessed on both sides or just on one? Indeed, when

[31] This market structure is also known as “competitive bottlenecks” (Peitz and Valletti, 2015).

positive indirect network externalities are taken into account, if a platform rises the price for users, demand of internet access should decrease. This will also have an impact on CAPs, since the consumer base will decrease as well. Thus, the loss in revenue for the ISP is higher if both sides are considered and a SSNIP test applied over only one side would underestimate the effect of a price increase. Finally, this insight suggests that market definition in electronic communication markets and digital services could be too narrowed.

5.3. Net neutrality and competition implications

In Broos and Gautier (2017), a model was proposed in order to analyse the incentives for ISPs to exclude an OTT, or charge users in order to access the OTT. The proposed framework presents various innovative features that help to better understand the competition problems associated with net neutrality. The considered markets are the internet and a communication one (both phone and VOD markets are taken as examples, from this point on I will consider only the latter). The operator acting as an ISP is also active in the audiovisual market, in which a SVOD OTT is present.

The approach proposed in the paper is based on the definition of one-way essential complement introduced in Chen and Nalebuff (2006). In Broos and Gautier (2017) the definition has been used to characterize the economic relationship between the ISP and the online platform: broadband access and SVOD OTT are both complements, but broadband access is essential for the OTT to be useful. Moreover, it is assumed that the VOD service offered by the ISP does not need internet in order to work. This implies that indirect network effects are not taken into account. If the ISP increases price for internet access, only the OTT will be affected, but not the VOD service.

The model is based on various assumptions. The VOD service and the SVOD OTT are vertically differentiated, meaning that one service is objectively better than the other one (in this case the SVOD OTT is considered the objectively better service). The two services are also horizontally differentiated. If we pictured a Hotelling line of size 1, the VOD and the SVOD services will be located at the extremes. This implies that a consumer will incur some disutility when buying one of the two services. Moreover, the consumers have heterogeneous valuations of the internet. Further assumptions are made. The market is fully covered, production costs are normalized to zero, there are no bundles offered by the

ISP, consumers cannot multi-home[32], and the consumption options available to end-users are the following: internet and VOD, internet and SVOD OTT, internet only, and VOD only.

Two effects are at play with respect to ISP revenues when the SVOD OTT enters the market. First, the SVOD OTT engenders a complementary effect. The OTT availability increases the value of the internet that can be monetized by the ISP by rising the internet access price. Second, there is a competition effect at play in the VOD market. Operator's revenues can decrease in the audiovisual market if the SVOD OTT is better than its VOD service, meaning that some users will switch to the online video platform.

In a monopolistic setting, the ISP will not exclude the OTT if it is better than its VOD service. The incumbent will rise the internet prices and the complementary effect will more than compensate the competition effect. The ISP can also monetize the presence of the OTT by surcharging the internet access of users using the online platforms. To do so, the ISP has to propose three different price levels for VOD, internet, and internet plus SVOD services. By enacting this strategy, the ISP will be better off than by excluding the OTT. By comparing this last strategy with a scenario in which net neutrality is enforced, it is not clear in which one consumer surplus is higher. If the ISP is able to change the price structure, prices for some consumers will be higher, but there could be a better matching (people not interested in the SVOD OTT service will be able to pay less to have internet access). However, if net neutrality is enforced, prices for internet could be lower, but with a resulting inefficient matching.

For the duopoly setting, there are two ISPs competing à la Bertrand (i.e. prices are equal to marginal costs due to competition). Two cases are considered. In the first, ISPs are symmetric by both offering the VOD service. In this case the competition effect by admitting the OTT is null. The complementary effect could be at play only if one ISP admits the online platform. In the second case, the ISPs are asymmetric because one of them does not offer the VOD service. In this case both complementary and competition effects come into play.

In the symmetric setting, the two ISPs play a two stage game. In the first stage they must choose whether to exclude or admit the SVOD OTT. In the second stage they must set the prices for VOD, internet and internet plus SVOD services. Starting by the second stage, when both ISPs admit or exclude

[32] Meaning that users cannot consume both the VOD and the SVOD OTT contents.

the SVOD OTT, their profits will be equal to zero since they are symmetric and competing à la Bertrand. However, when only one ISP admits the online video platform, it is able to differentiate price levels and surcharge the internet access of users using the SVOD OTT, enjoying alone the complementary effect. The other ISP will still have zero profits. Going back to the first stage, three Nash equilibria are possible: Admit/Admit, Admit/Exclude, and Exclude/Admit. Exclude/Exclude is not possible since there will be an incentive to deviate and admit the OTT. The three main insights of this setting are that the OTT will not be completely foreclosed from the market, net neutrality can be the result of an equilibrium without regulatory intervention, and consumer surplus and welfare are highest when both ISPs admit the OTT (since prices are equal to marginal costs, matching will also be better).

In the asymmetric setting, the first ISP selling the VOD service will always have positive profits, while the second ISP can have a positive pay-off only by admitting the OTT when the first does not. In this game the only Nash equilibrium is given by Exclude/Admit. The second ISP will always choose to admit the SVOD OTT. Because of that, the first ISP will always choose to exclude. If Admit/Admit were chosen, the price for internet plus SVOD would be equal to zero because of the Bertrand competition. Moreover, the competition effect on the VOD market would be fierce, driving down the price for VOD. In this setting the OTT is not completely excluded and consumer surplus is higher when both ISPs admit the OTT (i.e. net neutrality is enforced) since prices will be lowered due to the competition effect. However, in terms of total welfare it is not clear if net neutrality setting is the best case scenario for total welfare. Indeed, ISPs' profits will be lower and matching will be less efficient.

The two main results of this model are the following. First, when pricing restrictions are lifted, total exclusion of the OTT does not happen. Second, net neutrality could be used as a tool to intensify competition and reduce prices. However, since it can engender inefficient matching and lower profits for firms, it is not always welfare improving.

The model presents some limitations. The authors point out that network effects, investment issues and multi-homing were overlooked and could be used to enlarge and complete the model. With respect to network effects, as seen in the previous section, it could be interesting to see how surcharge pricing would change if the ISP had the possibility to charge also the OTT side.

I would also suggest to take into account the role of bundles and how they affect OTTs. As mentioned in previous chapters, incumbent operators can use bundles in order to hinder possible competition from SVOD OTTs in the audiovisual market. Thus, it would be reasonable to add bundles in the possible consumption choices of users, since competition effects from OTTs entry could be lowered.

6. Conclusions

In the first chapter I showed that there are definition issues concerning OTTs. In particular, audiovisual OTTs can be considered at the same time AVMS and ISS. Since the two definitions overlap, OTT audiovisual services fall under two sets of rules that can possibly lead to undesirable market distortions (de Streel and Larouche, 2016). A further issue concerns the distinction between linear and non-linear television. The borders between the two types of audiovisual services are blurry, since they are being increasingly offered by both digital and OTTs providers, and some consumers perceive the two services as substitutes. For example, Amazon has recently shown its interest in live contents by buying Premier League's[33] television rights[34]. In the same way, European television broadcasters have expressed the intention to join their forces in order to create competitive (S)VOD platforms[35].

The economic figures showed in the first chapter testify the rapid growth of SVOD OTTs in the European market. However the take-up rates of the newcomers and their economic weight in the audiovisual market are still relatively low with respect to the traditional television broadcasters. The fear of the incumbents that SVOD OTTs are massively stealing their customers does not seem justified. However, their demands for a fairer level-playing field have been acknowledged by the European institutions in the review of the AVMSD.

In the second chapter I presented the main features of the review of the AVMSD. It has been proposed to extend several measures to on-demand services, involving minors' protection, European Works quotas, and the reinforcement of the country-of-origin principle. Thus, steps forward have been made in order to reduce the lack of level-playing field between linear and non-linear television. However, a difference in regulatory treatment still persists.

In the third chapter I presented the Belgian audiovisual market and used it as a case study. The Belgian market is peculiar since the wholesale television market is regulated and the overall broadband coverage is the highest in Europe. In the recent market analysis, the CRC assessed that the relationship

[33] The English national football league.
[34] BBC Sport (2018), Premier League TV rights: Amazon to show 20 matches a season from 2019-2022, BBC, press article retrieved from https://www.bbc.com/sport/football/44396151
[35] Roxborough, S. (2018), European Networks Are Joining Forces to Take On Amazon and Netflix, Billboard, press article retrieved from https://www.billboard.com/articles/business/8464399/european-networks-are-joining-forces-to-take-on-amazon-and-netflix

between traditional television and SVOD OTTs is complementary. However, if substitutability were found between traditional television and SVOD OTTs, and the latter had a large customer base, the regulatory framework of the Belgian audiovisual market would drastically change, leading to the deregulation of the wholesale television market, and the removal of the access obligation. Since the Belgian market is strongly characterized by bundles competition, virtual operators could heavily suffer from the impossibility to offer television services in their packages.

In the fourth chapter I presented the traditional methods used by regulatory authorities to assess substitutability between goods or services. The current traditional framework does not seem appropriate to analyse the audiovisual market, since neither price, nor technical variables, are the main drivers of audiovisual services consumption choices. Instead, choice of customers in the audiovisual market seems more taste and content driven. Alternative studies have proposed new analytical frameworks in which consumers' perceptions are central in the assessment of substitutability between traditional television and online video platforms. These first studies could inspire some updates for the traditional and current framework used by NRAs to identify the relevant market.

In the fifth chapter I showed that the market structure must be taken into account by NRAs in the analysis of digital markets. Network effects and multi-sidedness of platforms are often overlooked. However, when considered, they show the flaws and inappropriateness of the traditional tools such as the SSNIP test. Moreover, net neutrality rule does not seem to be always the most welfare improving solution, and the possibility that incumbent operator(s) would exclude OTTs does not seem confirmed by the model presented in the fifth chapter. Given the unresolved debate on net neutrality, it will be interesting to monitor how competition in digital markets in the United States will evolve after the removal of net neutrality rule.

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