U.PORTO
FEP FACULDADE DE ECONOMIA
UNIVERSIDADE DO PORTO

CONTENT DISTRIBUTION STRATEGIES OF OVER-THE-TOP STREAMING PLATFORMS

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Dissertation
Master in Economics

Supervised by
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2023

Agradecimentos

No culminar de 5 anos de estudos na FEP gostaria de agradecer em primeiro lugar à minha família e amigos que me acompanharam durante este percurso.

Deixo também um agradecimento especial aos meus pais que me apoiaram e proporcionaram as melhores condições para estudar no Porto e para a minha irmã que me acompanha sempre.

Por último agradeço à professora Maria Paula Sarmento pela disponibilidade e ajuda na realização desta dissertação.

Abstract

Internet improvements and technological breakthroughs provided the ideal environment for the emergence of Over-the-Top Streaming platforms, allowing the stream of content directly online. An increasing number of consumers have transitioned to these digital streaming platforms as their principal source of entertainment which resulted in a significant shift in the media industry with the development of new strategies to produce, distribute, and consume content. As part of the digital landscape the streaming platforms industry is always evolving, having the ability to adapt to circumstances and customers' needs.

The aim of this dissertation is to evaluate how different strategies of movies' distribution influence the outcome of the companies and the market structure. A model was developed to analyze nine scenarios with different distribution strategies for two companies. The outcomes of the analysis suggested that the best distribution strategy for a streaming platform would be to simultaneously release its cinematic content in the platform and within traditional theater venues, up to a certain cost level.

JEL codes: L82, L11

Keywords: Over-the-top; Streaming platforms; Video-on-Demand; Sequential Strategies; Home-video

Resumo

O progresso tecnológico e as melhorias na infraestrutura da internet proporcionaram o ambiente ideal para o surgimento de plataformas de streaming Over-the-Top que permitem a transmissão de conteúdo diretamente online. Um número crescente de consumidores transitou para estas plataformas digitais utilizando-as como a sua principal fonte de entretenimento, o que resultou numa mudança significativa na indústria de media, tendo sido desenvolvidas novas estratégias para produzir, distribuir e consumir conteúdos. Como parte do cenário digital, a indústria da qual fazem parte as plataformas de streaming está em constante evolução, e tem a capacidade de se adaptar a circunstâncias excecionais e às necessidades dos clientes.

O objetivo desta dissertação é avaliar como diferentes estratégias de distribuição de filmes influenciam o resultado das empresas e a estrutura do mercado. Foi desenvolvido um modelo para analisar nove cenários com diferentes estratégias de distribuição para duas empresas. Os resultados da análise sugeriram que, até um determinado limite de custos a melhor estratégia de distribuição para uma plataforma de streaming seria lançar simultaneamente o seu conteúdo cinematográfico na plataforma e nas salas de cinema tradicionais.

Palavras-chave: Over-the-top; Streaming platforms; Video-on-Demand; Estratégias Sequenciais

Index

Figure Index

Table Index

1. Introduction

Over-the-top (OTT) streaming platforms have emerged to conveniently deliver content over the internet. Netflix, Disney Plus, HBO Max, Prime Video and Hulu are popular examples of this type of platforms.

This form of media is characterized by its distribution of content via internet, that is fundamentally changing the way consumers watch tv. A wide variety of quality content, accessible in multiple devices at any time and with no extensive commercial breaks is the package deal that keeps attracting subscribers and that made new platforms want to enter the market over the years. Disney, for example, used to produce its own movies and latter sell their streaming rights to platforms like Netflix but it eventually feared the strength of the competition and decided to create a platform of its own (Belleflamme & Peitz, 2021). Similarly other film producers observed the ongoing success of the pioneer Netflix and decided to join the market, taking advantage of the financial benefits of this direct source of revenue (Emster, 2019).

Streaming OTTs are capable of capturing value by charging for the content they offer whether it comes from a third party or it is produced in-house (Belleflamme & Peitz, 2021). There is not, however, a business model that dominates the sector of OTT streaming platforms and multiple options may be employed for each platform attribute (Park, 2019). Regarding content distribution there are different strategies that platforms have been adopting.

Decision making about the distribution of movies concerns the possibility of premiering the platform's licensed content on movie theaters. If considering a theatrical release, a decision remains regarding whether to release the movies simultaneously in the theater and platform or sequentially, with a period of holdback between channels.

There are undeniable benefits related to theatrical releases for both the movie companies, including box-office revenues and enhanced prestige for the movie, and for the clients, such as a distinct viewing experience and a pretext for social interaction. This step is, however, very expensive for producers and it has proven to not be profitable for all movies. Distributers believe there are some movies people are not willing to watch on the

cinema but will pay to see it in their home tv (Tefertiller, 2017) that is one of the reasons certain films may completely bypass theatrical releases.

OTTs are also a media service that can easily adapt to its users' needs, which is the reason why during covid-19 some companies decided to change their distribution strategy. The pandemic situation escalated the at-home video consumption (Gupta & Singharia, 2021) and emptied theaters forcing platforms to utilize more frequently strategies involving simultaneous theatrical and streaming releases and exclusive platform launches. However, in light of the lifting of pandemic restrictions and gradual return of audiences to cinema rooms, movies will likely gradually return to the big screen on a more regular basis (Whitten, 2022).

Given that there is currently no dominant distribution strategy and that several platforms have been changing their plan of action over the last few years, analyzing the strategies these companies use to distribute their content and monetize their services can provide valuable insights about the market in which they operate as well as contribute to understand the trends shaping the media and entertainment industry. Therefore, the question this dissertation aims to respond is: How different content distribution strategies of over-the-top streaming platforms affect their results and the market structure?

This dissertation is organized as such: Section 2 reviews the literature related to Over-the-top streaming platforms and their distribution strategies for movies. Section 3 presents the model used to evaluate the distribution strategies of streaming platforms. Section 4 includes the analysis of various scenarios with different launch strategies by companies where market prices and respective profits are determined. Section 5 discusses the results and finally the conclusion is presented in section 6.

2. Literature review

2.1 Birth of Over-the-top streaming platforms

The dynamism of the digital world, rapid growth of technological abilities that facilitate the use of digital media and the heightened scope and velocity of the Internet created a need for television and media to reinvent themselves. OTT streaming platforms emerged to satisfy a new demand and fill the gap in the media landscape (Hadida et al., 2021; Menon, 2022; Mulla, 2022).

There is no universally accepted definition for OTTs, as it is still being widely debated but it is possible to characterize them as a service that enables the sharing of information and promotes communication (Mulla, 2022). There is a wide variety of OTT media services that can deliver different content including audio and video over the internet directly to the consumers, bypassing the need for traditional telecom operators (Kokaram et al., 2015). Some of these platforms compete with traditional media channels, offering a different method to deliver tv programming through the internet avoiding the need for satellite or cable (Brown, 2014; Mulla, 2022).

When discussing OTT streaming platforms, it is imperative to mention the concept of video-on-demand services (VOD) which is a system that grants the users immediate access to content, when and where they desire. The majority of streaming platforms in the market offer VOD services which consists in the opportunity to choose content and instantly play it rather than having to comply with a fixed broadcast. This engenders a greater level of flexibility and convenience for users (Hilderbrand, 2010; Kim, 2006).

Streaming platforms have multiple perks, but their birth was not universally approved. The emergence of these platforms negatively affected traditional paid-tv services. Corded media providers, such as satellite and cable television, were up till then able to maintain a significant slice of tv viewership across a span of multiple decades by providing a wide range of programming choices but with the emergence of streaming platforms end up having to face new competition with innovative features (Hilderbrand, 2010; Snyman & Gilliard, 2018).

It is possible to relate the rise of OTTs with an acceleration of the Cord-cutting phenomenon, which can be described as the cancelation of traditional cable television subscriptions and adoption of streaming services as the primary mean of watching television content (Tefertiller, 2020). Malone et all (2021) developed a study in which its results

indicated direct substitution of viewing habits from tv to OTT video alternatives. They also identified those who had the habit of watching programs easily accessible on streaming platforms as more likely to cancel their traditional cable or satellite tv subscription in comparison to those who had preferences for channels where there was a lack of close substitutes in OTT (for example sports programs). In addiction the authors noticed a few common characteristics in households that tend to cut the cord: they are typically smaller and younger households that have lower-income and that heavily used the internet (Malone et al., 2021).

Alongside new platforms that have emerged to deliver content online and which diverted customers away from cable and satellite tv also traditional media companies such as HBO and other payed-tv services, launched their own streaming platforms and entered the OTT space offering exclusive content that wasn't available on competing services. That transition gave them the possibility to extend their business to broader audiences (Leswing, 2020). This implies that even well-established television channels looked for ways to reinvent themselves and gave in to the pressure caused by the cord-cutting movement. It also suggests that some consumers, who previously maintained traditional television services due to the exclusive content that could not be found on any other platform, lost the reason that kept them from transfer to an OTT service.

For consumers this swap seams to increase the value of their experience since it is believed that the cost-benefit of cable tv subscriptions is higher than that of streaming subscriptions. Consumers may reach the conclusion that cable and satellite packages cost more than they are worth specially when given the opportunity to change to a lower cost alternative (Crawford, 2016; Tefertiller, 2020).

From a cinema perspective, streaming platforms have also changed the normality in theater's rooms. The transition to this new, more convenient, and accessible way for audiences to consume art led to a decrease in the frequency of viewing films in theatrical settings (Hadida et al., 2021). When the price of a single movie ticket is close to the price paid for a month's subscription of a streaming platform, where you can watch a collection of movies endlessly, it becomes appealing to substitute going to the movies for the comfort of a home (Granados, 2021).

2.2 Pandemic effect

The exponential growth of streaming platforms and its great impact on cinemas it's almost impossible to dissociated from the influence of the Covid-19 pandemic. The outbreak of the pandemic brought, on the one hand, unprecedented disruptions in multiple sectors, and on the other hand, created opportunities for some business areas to thrive.

As governments ordered locked downs theaters were being forced to close their doors which inevitably resulted in movie releases being pushed back, and numerous movies being launched straight on streaming platforms completely bypassing theatrical releases (Granados, 2021; Mendelson, 2022). With cinemas shut down producers had to rethink their release strategies for movies, obviously releasing only on theater would result in little to no revenues therefor streaming platforms offered the perfect solution to escape the uncertainty of theatrical distribution and still reach a wide audience. This type of distribution was beneficial for studios and movie makers and presented an opportunity for streaming platforms to further expand their subscriber base (Sharma & Lulandala, 2022).

By offering a vast collection of films and series that provided one of the few forms of entertainment for people closed within 4 walls, streaming platforms also became part of everyday life for more users thus experienced an exceptional market increase worldwide (Chaudhari & Damle, 2023; Granados, 2021; Gupta & Singharia, 2021). In 2020, the start of lockdown, Movie theatre box office revenues fell 71% and Netflix attracted a record 37 million net additional subscribers (PWC, 2021).

Apart from the already existing OTTs taking advantage of the situation also new players entered the market. Some traditional studios acquired or developed online streaming services believing this was the right time to create their own platform and deliver content to the public directly.

When the restrictions and isolating measures were lifted, people re-engage with pre-pandemic activities and forms of entertainment such as going to the theater which may have led to a diminished reliance on streaming video services (PWC, n.d.). Nevertheless, the bruises of the pandemic remained in the cinema industry to a certain extent. The atypical situation changed people's behaviors and lifestyle which also altered the way media is consumed and it is believed that some of the habits acquired during this time will endure (Gupta & Singharia, 2021; PWC, 2021).

Although the effects of the restrictions can only be fully verified in the coming years, it is already possible to notice a decline in the time theaters can hold-up films exclusively in their rooms, in other words, the window between theaters and streaming platforms is shrinking. Movies are normally distributed accordingly to a windowing model (Owen & Wildman, 1992) allowing consumers to watch a film in different markets. The content is launched to different channels according to the income that each channel can generate starting on the highest which means consumers pay a higher price to watch the film in first hand and then gradually decreasing thorough secondary channels (Gaustad, 2019; Owen & Wildman, 1992). The practice in which movie distributors sequentially release theatrical films in different windows, starting with theatres and followed later by other distribution channels (in this case streaming platforms), allows consumers to choose, based on their willingness to pay, the channel they prefer making this a form price discrimination.

There has been a wide debate among industry experts related to the timing and order of movie releases (Hennig-Thurau et al., 2007). The distribution possibilities opened in the pandemic urged the establishment of up-to-date exhibitor's exclusive window requirements. Movie studios and producers are signing agreements with theater rooms from 45 to as little as 17 days of exhibit exclusivity in contrast to the previous years when it took 60 to 90 days films to arrive on SVOD platforms (Ahouraian, 2021; Katz, 2021). Theaters are still in business, but movies are reaching people's homes sooner.

This strategy of shallow theatrical windows allows movie producers to benefit both from revenues coming from box office and profits from the platform channel. A shorter exclusivity in theaters gives the opportunity for OTT to capture the hiss and momentum that surrounds the release of a movie and use that to attract more users to their platforms therefore generating higher revenues (Ahouraian, 2021).

This cinematic shift also opened the doors for a strategy of content distribution with different timings. Same-day, also named "day-and-date" releases gained popularity (Chaudhari & Damle, 2023; Granados, 2021), a topic that will be further explored in the next section.

2.3 Business model of OTTS

Streaming platforms can be classified according to the business plan they choose to embrace (Carroni & Paolin, 2020; Mulla, 2022). In the subscription-based plan, a consumer subscribing to the service pays a fee and has unlimited access to the content the platform has to offer. In the advertisement-based plan the content is offered to users at no or at a lower cost since the model employs the use of advertising to generate revenue (the use of this strategy alone is not common for OTTs, but it can be seen mixed with other strategies). Hybrid models combine strategies from both plans mentioned above and can also include pay-per-view options which translates in the possibility for viewers to pay for exclusive content that is not otherwise included in the subscription plan. Exploring combined strategies may increases the sources of revenues for the platforms (Mulla, 2022).

Currently the streaming industry can be classified as an oligopoly, with each company having tremendous market power, in 2020 only five streaming services-controlled 83 percent of United States connected tv usage in 2021. Those companies were Netflix, YouTube, Prime Video, Hulu, and Disney (Pakula, 2021). Most of these streaming platforms are still heavily dependent on subscribers but are currently trying to expand their revenues by including mixed strategies in order to provide a cheaper price to uses and, in that way, attract new clients and maintain the existing ones (Fitzgerald, 2023).

Traditionally streaming platforms relied on content of external producers, such as studios or tv networks, and had to license the content of other producers to supply a selection of films to their users. However recently they decided to go further and start producing their own content. By creating their own exclusive movies and series, they were able to take total control over the creative process, allowing them to tailor content specifically for their streaming platforms and target their subscribers' preferences. Disney+, Netflix, HBO Max, and Apple TV+ are examples of platforms that produce their own content, these platforms are also major in the industry, they have established their own production, distribution, and exhibition strategies, being vertically integrated (Norris, 2023).

As a movie producer each platform has in their "hands" the responsibility to select their content distribution strategy. Platforms can be distinguished among them by the manner in which they choose to make content available for users.

First of all, it is important to mention that it is challenging to predict the success a movie will have in the market which means there is a substantial risk associated with movie industries. Movies' properties include the fact that their utility for the consumers is hard to evaluate and it has characteristics of a non-rivalrous good (if a consumer watches the movie that does not prevent the others from doing so) that means companies have very low marginal costs of producing to additional audiences which leads them to try to distribute their content for as long as audiences are willing to pay it (Nam et al., 2015).

Sequential strategies constitute an attempt to keep the content on the market longer. As mentioned before on section 2.2 movies can be released following a window model, starting with normally theatrical release, and sequentially releasing to streaming and other home-video scenarios. This strategy is a type of video release that promotes the distribution to additional audiences. The goal is to maximize producers' surplus taking advantage of viewers' various levels of preferences and willingness to pay. This strategy enables consumers to watch movies through different channels since it involves distributing the same content at different times and prices (time and price differentiation) via different channels (media differentiation) (Gaustad, 2019; Nam et al., 2015).

The sequence in which a movie is distributed uses both the quality of the viewing experience and the window between the releases to segment low value consumers from high value consumers (Waterman et al., 2007). Clients that attribute more importance to an improved experience will be going to the theater, those who are willing to wait more time and do not attribute such importance to the viewing experience will be watching the movie at home.

The movie industry is mindful of the benefits of sequential strategies for views and produces and had extensively adopted them, yet these strategies have also been transformed over the years. As an example, in the past, the growing importance of video/DVD channels reduced the holdback time between theatrical distribution and DVD distribution (Nam et al., 2015).

Despite the changes over the years the order of release has been kept the same with theatrical distribution always coming first. However, continuous technological improvements and the relatively recent emergence of VOD channels shifted the focus of the industry to a more convenient and less expensive, way to distribute content (August et al., 2015; Nam et al., 2015) which by itself has potential implications to sequential strategies, altering the order of release and narrowing, even more, the holdback between channels (Nam et al., 2015) aside from the already mention pandemic effect that lead to a shattered window.

Assuming consumers decide to go to the theaters expecting movies to not be available in home-video platforms for a certain period of time, a shorter window between releases could stimulate platforms producing and distributing movies to take advantage of these perceptions attracting the biggest audience they can when they first release through theatrical channels and as soon as market becomes exhausted immediately release their content online (Waterman et al., 2007). The theater market is typically exhausted within 1 to 4 months after the launch of a movie (Waterman et al., 2007) and a large portion of the box-office tickets are generated sold within one or two weeks of the movie release (Lehmann & Weinberg, 2000) therefor a quicker transition of content between channels would prevent movies from streaming in the cinemas too long generating little to no revenues.

Concerning the distribution order, currently it is already possible to perceive a few changes in the way companies choose to release their content, compared to the past. As examples we have the fact that "day-and-date" strategies (when a film is released across multiple channels at once) are frequently an option, and the same is happening with "direct-to-video" strategies (when a movie is not exhibit in theaters but rather exclusively distributed to home video) (August et al., 2015). OTT platforms that both produce and distribute their content are the biggest adopters of these strategies. Netflix, for example, is committed to streaming channels, making their products available only on the platform, with few exceptions that are launched at specific theater locations for a limited amount of time (Hadida et al., 2021; Sperling, 2022); Disney Plus and HBO, also adopted "day-and-date" strategies for part of their content, premiering movies on the platform and theater at the same time.

August et al. (2015) took a normative approach to the study of theater and video release times taking into account the consumers' behavior, market conditions, movie characteristics, and operational factors. The goal was to understand the best time and pricing strategies for releasing a video in order to maximize profit for the studios, considering different options such as the release of the video straight to online platforms and simultaneous theatrical and online release.

The research model took into consideration factors that affect consumption, namely: The idea that the quality of the content deteriorates over time (a movies' value reaches its peak at launch and then it decreases over time); The gap of price and quality between alternatives; The additional value that a video alternative provides besides the benefit of consuming the movie itself (residual value); Theater congestion (when there is high demand at launch,

commonly with blockbusters). From the results of the study, it is possible to highlight evidence suggesting that when the movie's quality decreases, it is more likely for its distribution to me made using a direct-to-video strategy, this is corroborated by the fact that various mid and low-budget films are only released on OTT platforms and not cinemas (Asmelash, 2022). It's important to recognize that streaming platforms have the flexibility to tailor their strategy based on the type of film they intend to release and their expectations regarding that film's performance, thus not following a single content release strategy.

Prior empirical research on sequential distribution strategies have been mainly limited to two major channels: theatrical and DVD (Ahmed & Sinha, 2016; Lehmann & Weinberg, 2000; Waterman et al., 2007). However, nowadays the significance of DVDs has decreased compared to the past and the importance of VOD keeps increasing, which should be considered while studying the distribution of movies.

Nam et al. (2015) introduced VOD channels to the analyze of the determinants and optimal profit scenario of sequential strategies. Results suggested that the holdback period between channels, the sequential order and the price of the movies are relevant determinants for the consumers when it comes to the selection of a channel. When a channel has a longer holdback period and/or a higher price that will negatively affect the consumers preference for that channel and will positively affect their choices for other channels.

Also focusing in VOD channels Hadida et al. (2021) proposed a different approach to film release strategies, which concerns two distinct logics: commitment and convenience. The commitment logic is rooted in traditional theatrical release practices, while the convenience logic emerged with the surfacing of digital libraries and subscription models offered by OTT streaming platforms. The authors defined and analyzed various scenarios within these two logics to provide a comprehensive understanding of the factors that influence the production and distribution of movies.

Companies operating under the commitment logic will spend money to try to attract audiences to the cinema and then collect part of the revenues from box-office tickets. On the other hand, the goal of the companies operating under the convenience logic is to increase subscriptions, so effort is exerted to provide an extensive catalogue of movies to users. Various interaction possibilities between these two logics were analyzed in the article.

It is relevant to mention the "Committed Convenience" logic where, as the name indicates, there is a blend of the two logics. From the OTTs perspective this can mean the theatrical

distribution of blockbusters (very popular and successful films) and exclusive online streaming of small and mid-budget movies, as mentioned above this is an ongoing strategy for OTTs (Hadida et al., 2021).

2.4 Substitutability between theater and streaming

Defining substitution as the consumers' tendency to switch from one product to an alternative that fulfills the same purpose, if a new form of media is capable to fulfill goals similar to those of older entertainment form, the new media is more likely to become a substitute for the older medium (Cha & Chan-Olmsted, 2012). In other to classify theater and streaming as substitutes is necessary to understand whether individuals perceive these two mediums as analogous in function or divergent in their purposes.

Given the premise that people have a limited amount of time to dedicate to media and non-media activities the emergence and adoption of a new form of entertainment by audiences can lead to a decline in time devoted to other existing forms (Cha & Chan-Olmsted, 2012). This concept can be extended to the context of cinema and streaming, the emergence of OTT platforms may potentially result in a reduction in the frequency of cinema attendance.

The pandemic was a time when, out of necessity, cinema was mostly replaced by streaming platforms, during that time streaming content seemed to be a close substitute for cinema. After this replacement, now returning to normality, many viewers continued to prefer the streaming option (Ryu & Cho, 2022). Customers are satisfied with the service and cost of the OTT Platforms when compared to cinema theaters (Robert et al., 2022).

The coexistence of VOD and traditional cinema, alongside the success of sequential distribution strategies, serves as evidence that individuals continue to use both ways of movie consumption. Audience differentiate between the films they choose to watch in the comfort of their homes and those they opt to view in a cinema setting, preferring to view at home a film that bring them stronger cognition gratifications and take advantage of the immersive environment of cinema rooms to view movies that brings them affective gratifications such as having a good time, experiencing exiting visuals and sounds and have emotionally responses that are hard to replicate at home (Tefertiller, 2017).

Theater has particular specifications that makes it different from traditional television and new media platforms, apart from the atmosphere with larger sound screens, better sound quality and unic ambience, some people also associated the experience of going to the movies

with also doing other social activities such as eating out, meeting with friend etc. (Valentine, 2019). To watch a movie in the theater has to do with more than the film itself and that is why it can be considered by some as a complementary option alongside home streaming.

In conclusions streaming platforms are not entirely replacing the theater experience but provide a viable alternative that prompts some of audience to replace traditional cinema outings with convenient home-based viewing. To a certain extent watching the movie on the theater room or by subscribing to a streaming platform can satisfy a similar consumer need or desire It is, therefore, possible to assume that there is a certain degree of substituting between the two mediums.

2.5 Substitutability between OTTs

As said before there are currently multiple platforms competing in the market, they all offer different and often exclusive content and subscriptions do not have to be exclusive to a single platform, in fact a significant number of users concurrently subscribe to the services of multiple platforms thus expanding their consumption possibilities. A consumer research conducted in United States of America found that 53% of American households have four or more video on demand services in 2023 Group (2023).

For these users, different streaming platforms can be considered complementary, but it is pertinent to understand if this the case for the general audience.

The existence of different content in all the platforms differentiates them but they are still close in the sense that all the platforms display a similar type of content, with some of the movies and tv content overlapping between them (Clark, 2021). If we view the subscription to streaming content as a form of general entertainment and as an alternative to traditional tv, different OTTs can be substitutes.

In addiction some consumers have budget restraints and can only allocate money to a single subscription and therefor these platforms are viewed as substitutes as they choose one over the other.

2.5.1 Competition for price

Given that many users engage in decision-making processes to select the streaming service that aligns with their needs, OTT platforms compete to ensure the largest possible user base.

On competing amount each other streaming platforms may use product differentiation through pricing as a strategy to attract and retain subscribers (Norris, 2023).

According to the results of the Pc magazine survey, as reported by Forbs, in 2019 65% of SVOD streaming platforms' users would cancel their subscription over an increase of the cost of their subscription. Conversely, only 9% of those surveyed indicated they would leave the platform in the absence of exclusive original content (Csathy, 2019).

A poll conducted by Ipsos in September of 2022 among American streaming service users revealed that 92% of the responders believed the price which they pay for a streaming service plays an important role in their decision to subscribe and 65% described it as very important. This makes the cost the primary factor in their decision-making process playing a critical role in determining the choice of a streaming service. The available content in the platform is a close follower as it was perceived as important by 87% of the responders (IPSOS, 2022).

In addition, supporting the previous results, according to the 2021 Digital Media Trends report by Deloitte nearly half of the responders (46%) of a conducted survey regarded cost as the most important factor when deciding whether to subscribe to a new video streaming service. In contrast, only 35% listed the possibility to access a broad range of content as a top reason to subscribe (Westcott et al., 2021).

In this way, price seems to be the reason that is most considered when decisions are made between competitor platforms.

3. Model

The aim of the model developed in this chapter is to contribute to the explanation of the decision of Over-The-Top platforms regarding the distribution of movies. It will be analyzed how different movie distribution strategies of Over-The-Top streaming platforms affect the results of the companies involved as well as the market structure. The model will consider two companies (company A and company B), both subscription-based OTT platforms who have full control of production and distribution of their content. The goal of both platforms is to maximize their profit.

The two companies will make decisions regarding the release site of the film (theater rooms or/and platform) and the timing of distribution (simultaneous distribution, sequential distribution).

This model will also consider a series of assumptions:

Assumption 1: In the platform channel every user of the company pays the same subscriber fee with no differentiation (no age or group discounts for example). This way every single consumer will bring the company the same amount of additional revenue and there is no other source of platform revenue rather than the subscriptions.

Assumption 2: Regarding the objective of revenue maximization, the companies will be considered both as producers and distributers, meaning they each are responsible for creating and delivering their own content.

Assumption 3: Both companies produce movies with similar characteristics, and there for the products offered by the companies are considered imperfect substitutes.

3.1. Demand functions

This section will define movie's demand functions in the theater market and on the streaming market for the two competing companies A and B that produce their own products and can later distribute them through different channels.

The premise is that the demand functions assume a linear form and can be derived from the problem of utility maximization of a representative consumer in each of the markets assuming a quadratic utility function. The description of the functions were based on the models developed by Donder (2006) and Valente (2009) in their work concerning the letter market.

Four demand functions will be defined, namely demand functions for the movies produced by company A on the theater and platform markets, as well as demand functions for the movies of company B in the same markets.

It is assumed that although they are not homogeneous there is a certain degree of substitutability between the products offered by the two companies and for that reason the demand functions for the same market (platforms or theater) interact with each other. This suggests that when a client considers paying to watch a movie, they observe the prices of both markets before making their decision.

Considering the aforementioned points, the demand functions are defined as it follows:

Company A, Theater market: $Qt_A = \alpha - \beta Pt_A + cPp_A + dPp_B + ePt_B$

(3.1)

Company A, Platform market: $Qp_A = a - bPp_A + cPt_A + dPp_B + ePt_B$

(3.2)

Company B, Theater market: $Qt_A = \alpha - \beta Pt_B + cPp_B + dPp_A + ePt_A$

(3.3)

Company B, Platform market: $Qp_A = a - bPp_B + cPt_B + dPp_A + ePt_A$

(3.4)

Where:

Pt_A and Pt_B represents, respectively, the revenue per ticket sold at the theater of company A and company B

Pp_A and Pp_B represents, respectively, the revenue per subscription on the platform of company A and company B

"c" is the parameter that represents the substitutability from the customers' perspective between theater and platform, it is assumed equal in all demand functions.

"d" and "e" are the parameter that reflects the degree of substitutability between the products of the two companies in the same geographic market (d for the platform market and e for the theater market). Both are considered positive, assuming that when one company

increases the price of their products in a particular market, it will result in an increase in the price of the product offered by the other company in the same market.

a, α, b, and β are parameters.

3.2 Cost functions

The cost functions of both companies should reflect the costs incurred while producing and distributing a movie. The following representative parameters of the cost structure will be considered:

C represent costs related to the release of the film in theaters that are supported by the companies. This encompasses costs with marketing, promotion, distribution fees, events, among others. This particular cost variable exhibits no dependence on the quantity of tickets sold and is only supported by the company when it decides to release the film in theaters.

F represent fixed costs related to the film production. This is a cost borne by companies regardless of the chosen distribution channel

It is assumed that both companies have similar costs with the production and distribution new movie and therefore "C" and "F" will have the same value for companies A and B.

3.3 Profit Functions

The payoff for both companies will group the profit of two periods, $\Pi = \pi_1 + \pi_2$.

Period 1 corresponds to the first month of the film's release and period 2 corresponds to the month immediately following the film's release. The goal of this periodic division is to differentiate the moments of the film's release when a sequential strategy is chosen. In other words, when companies decide to opt for a sequential launch strategy, then they will have profit functions structured differently in each period as their source of revenue changes.

Depending on the strategy chosen by each company, the profit functions will assume different forms. Company A and B have symmetric profit functions therefore the following section presents the generic profit functions in different scenarios.

Setting P:

$$\Pi_X^P = \Pi_{1X}^P + \Pi_{2X}^P$$

(3.5)

$$\Pi_X^P = 2\left(Qp_X^P * Pp_X^P\right) - F$$

(3.6)

$$\Pi_X^P = 2\left(a - bPp_X^P + dPp_Y^P + ePt_Y^P\right) * Pp_X^P$$

(3.7)

This setting represents a strategy in which the company X launches the movie only to Home-Video using the platform channel, consequently there is no theater price for company X in both periods.

It is assumed that the price and quantity demanded does not change from one period to another and therefor the profit function of the first period is repeated in the second.

As mentioned above "F" is a fixed cost therefor is the same for both periods and is not repeated. "C" is absent as there is no costs associated with theatrical release.

Setting S:

$$\Pi_X^S = \Pi_{1X}^S + \Pi_{2X}^S$$

(3.8)

$$\Pi_X^S = \left(Qt_X^S * Pt_X^S\right) + \left(Qt_X^S * Pt_X^S + Qp_X^S * Pp_X^S\right) - F - C$$

(3.9)

$$\Pi_A^S = \left(\alpha - \beta Pt_X^S + dPp_Y^S + ePt_Y^S\right) * Pt_X^S + \left(\alpha - \beta Pt_X^S + cPp_X^S + dPp_Y^S + ePt_Y^S\right) * Pt_X^S + \left(a - bPp_X^S + cPt_X^S + dPp_Y^S + ePt_Y^S\right) * Pp_X^S - F - C$$

(3.10)

$$\Pi_A^S = 2\left(\alpha - \beta Pt_X^S + \frac{1}{2}cPp_X^S + dPp_Y^S + ePt_Y^S\right) * Pt_X^S + \left(a - bPp_X^S + cPt_X^S + dPp_Y^S + ePt_Y^S\right) * Pp_X^S - F - C$$

(3.11)

This setting represents the situation in which the company releases its films first on theaters followed by the platforms release in the next period (sequential strategy).

On the first moment there will not be any platform release and therefor the platform price will equal to zero in the first period.

It is assumed that the theater price stays the same in both periods. In this setting the company receives only revenue from theater in the first period and revenues from both channels in the second.

As previously stated in the preceding setting, "F" and "C" continue to denote the costs associated with both time periods.

Setting D:

$$\Pi_X^D = \Pi_{1X}^D + \Pi_{2X}^D \tag{3.12}$$

$$\Pi_X^D = 2\left(Qt_X^D * Pt_X^D + Qp_X^D * Pp_X^D\right) - F - C \tag{3.13}$$

$$\Pi_X^D = 2\left(\alpha - \beta Pt_X^D + cPp_X^D + dPp_Y^D + ePt_Y^D\right) * Pt_X^D + 2\left(a - bPp_X^D + cPt_X^D + dPp_Y^D + ePt_Y^D\right) * Pp_X^D - F - C \tag{3.14}$$

This setting represents a situation in which the company uses a "day-and-date" strategy and releases the movie at the same time on theater rooms and on the platform.

It is assumed that the prices and demand in both markets stays the same in the two periods and therefore profit function in each of the markets does not change from one period to the next. In this setting the company receives revenue from two channels in both periods.

The costs "F" and "C" are accounted only once.

3.4 Game sequence

The strategic interaction between companies will be described through a sequential game with the following timing:

State 1:

Company A will decide whether to launch the film on theater rooms or only on its platform.

Stage 2:

If on stage 1 company A decides to release the movies only on the platform, then no other decision is made on this stage.

If on stage 1 company A decides to release the movies on the platform and on theater rooms, then, on this stage, the company is faced with the decision to either launch the movie on both channels simultaneously or launch it first on theater and release it on streaming after a month using a sequential strategy.

Stage 3:

On this stage company B makes a decision symmetrical to that of company A in stage 1, whether to launch the film on theater rooms or only on its platform.

Stage 4:

Analogous to the scenario experienced by company A, if on stage 3 company B decides to release the movies only on the platform, then no decision is made on this stage.

If on stage 4 company B decides to release the movies on the platform and on theater rooms, then it must decide between a same day release and sequential strategy.

Stage 5:

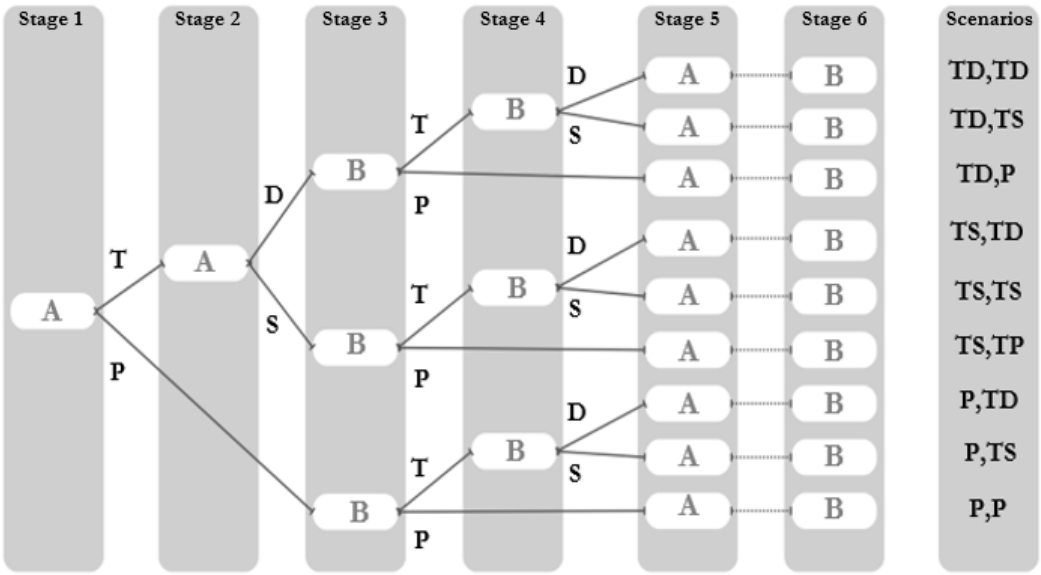
Company A decides the price for the markets where it operates.

Stage 6:

Company B decides the price for the markets where it operates.

For a better understanding presented below is the schematic illustration of the game with its different stages and final scenarios.

Figure 1 –Illustration of the competitive game between company A and company B



Source: Author's own elaboration

Label:

Represents the decision-making point for company A and B.

——— Represents the decisions made by the companies. With "T" being theater, "P" being platform, "S" being sequential, "D" being "day-and-date".

------ Represents the decisions of both companies regarding the prices.

TD,TD - Companies A and B launch the movie in both channels using a "day-and-date" strategy.

TD, TS - Company A launches the movie in both channels using a "day-and-date" strategy and company B launches the movie in both channels using a sequential strategy.

TD, P - Company A launches the movie in both channels using a "day-and-date" strategy and company B launches the movie only on the platform.

TS, TD - Company A launches the movie in both channels using a sequential strategy and company B launches the movie in both channels using a "day-and-date" strategy.

TS,TS - Companies A and B launch the movie in both channels using a sequential strategy.

TS,P - Company A launches the movie in both channels using a sequential strategy and company B launches the movie only on the platform.

P,TD - Company A launches the movie only on the platform and company B launches the movie in both channels using a "day-and-date" strategy.

P,TS - Company A launches the movie only on the platform and company B launches the movie in both channels using a sequential strategy.

P,P - Companies A and B launch the movie only on the platform.

This game can be classified as a dynamic game of complete and perfect information since it has the following specific characteristics: the players' moves are sequential, all the moves are observable before the next move is chosen and the payoffs from every possible combination of actions are known among all the players (Gibbons, 1992). This game can, therefore, be solved using backwards induction theory. company A will anticipate how company B will react to its decisions and then it will work backward through the game tree to identify the best possible strategy that considers company B's rational responses.

3.5 Estimations

Given the number of variables involved in the demand functions and profit functions, to simplify the comparison of outcomes across various scenarios assumptions will be made about the values of parameters a, α, c, d, and e.

Firstly, for the parameters "a" and "α" a specific value will not be defined but it will be assumed that the two are equal (a=α).

Regarding the parameter representing the substitutability from the customers' perspective between movies launched on theater and on streaming platform. For all said on chapter 2.4 it is possible to assume that both channels are not purely substitutable. "c" will assume the value of 0.18. which correspond to the value obtained by (Nam et al., 2015) when calculating the cross-price elasticity between premium VOD (where OTTs streaming platforms are inserted) and theatrical releases. Cross-price elasticity corresponds to the percentual change in the quantity demanded of a good in response to a given percentage change in the price of another good, if the cross price elasticity is positive the goods are substitutes (Perloff, 2020).

Based on the conclusions drawn from section 2.5, the value attributed to "d" and "e" will have to represent the imperfect substitutes. To simplify, it is presumed that the degree of

substitutability is the same in both markets affecting both companies to an identical extent. The value will be set in 0.1.

To define the values of "b" and "β" estimations on the price elasticity of demand of theaters and prime VOD will be used. The price elasticity of demand corresponds to the percentage change in the quantity demanded in response to a given percentage change in the price Perloff (2020). In this case the variation in the quantity demanded for theater tickets or platform subscriptions with an increase in the price of the correspondent channel.

The value of "β" will be set in 0.93 meaning that the rate of increase in movie price leads to a decrease in the rate of demand. The value of "b" will be set in 0.17 which means that the rate of increase in price also lead to a negative change in demand but in a slighter variation ((Nam et al., 2015). Both of these values assume that consumers are sensitive to change concerning movie prices in theatres and in OTT platforms.

With the appropriate substitutions, the demand equations of both companies can be defined as:

Company A, Theater market: $Qt_A = a - 0.93Pt_A + 0.18Pp_A + 0.1Pp_B + 0.1Pt_B$

(3.15)

Company A, Platform market: $Qp_A = a - 0.17Pp_A + 0.18Pt_A + 0.1Pp_B + 0.1Pt_B$

(3.16)

Company B, Theater market: $Qt_B = a - 0.93Pt_B + 0.18Pp_B + 0.1Pp_A + 0.1Pt_A$

(3.17)

Company B, Platform market: $Qp_B = a - 0.17Pp_B + 0.18Pt_B + 0.1Pp_A + 0.1Pt_A$

(3.18)

4. Analysis of different scenarios

In this section different scenarios will be analyzed, and the prices and profits of companies A and B will be calculated for each of them using a backwards induction method. The starting point will be to define the prices that maximize company B's profit. Subsequently, the optimal prices for company B will be integrated into company A's demand function, and this will culminate with in the determination of prices that, likewise, maximize company A's profit.[1]

It is considered that company B always enters the market and, therefore, the monopoly situation will not be considered or analyzed.

Within this segment the values and assumptions previously defined for the parameters a, α, c, d, b, and β will be used.

4.1 Platform release for company B

If company B chooses to launch its movies only in the platform, its profit function will be defined as:

$$\Pi_B = 2\,a - 0.17Pp_B + 0.1Pp_A + 0.1Pt_A) * Pp_B - F \tag{4.1}$$

To maximize profit the platform price of company B will be defined as:

$$\frac{\partial \Pi_B}{\partial Pp_B} = 0 \tag{4.2}$$

$$2a - 0.68Pp_B + 0.2Pp_A + 0.2Pt_A = 0 \tag{4.3}$$

$$Pp_B = \frac{a + 0.1(Pp_A + Pt_A)}{0.34} \tag{4.4}$$

To find the optimal strategy for company A we integrate the optimal platform price of company B into the profit function of company A for each possible scenario:

[1]Throughout this chapter, prices and profit outcomes will be rounded to three decimal places.

4.1.1 Platform release by company A (P,P branch)

If company A chooses to release its content only in the platform its profit function will be defined as:

$$\Pi_A^P = 2\left(a - 0.17Pp_A^P + 0.1\left(\frac{a + 0.1Pp_A^P}{0.34}\right)\right) * Pp_A^P - F \quad (4.5)$$

To maximize profit the platform price of company A will be defined as:

$$\frac{\partial \Pi_A^P}{\partial Pp_A^P} = 0 \quad (4.6)$$

$$2a - 0.68Pp_A^P + \frac{0.2a}{0.34} + \frac{0.02Pp_A^P}{0.34} = 0 \quad (4.7)$$

In this scenario the prices and profit of both companies will be:

$Pt_A^P = 0;\ Pp_A^P = 4.167a$

$Pt_B^P = 0;\ Pp_B^P = 4.167a$

$\Pi_A^P = 5.903a^2 - F$

$\Pi_B^P = 5.903a^2 - F$

Both companies will have the same platform price and the same profit.

4.1.2 Sequential release by company A (TS,P branch)

If company A chooses to release its content using a sequential strategy its profit function will be defined as:

$$\Pi_A^S = 2\left(a - 0.93Pt_A^S + 0.09Pp_A^S + 0.1\left(\frac{a + 0.1\left(Pp_A^S + Pt_A^S\right)}{0.34}\right)\right) * Pt_A^S + \left(a - 0.17Pp_A^S + 0.18Pt_A^S + 0.1\left(\frac{a + 0.1\left(Pp_A^S + Pt_A^S\right)}{0.34}\right)\right) * Pp_A^S \quad (4.8)$$

To maximize profit the platform price of company A will be defined as:

$$\frac{\partial \Pi_A^S}{\partial Pp_A^S} = 0 \quad (4.9)$$

$$0.18Pt_A^S + \frac{0.02Pt_A^S}{0.34} + a - 0.34Pp_A^S + 0.18Pt_A^S + \frac{0.1a}{0.34} + \frac{0.01Pt_A^S}{0.34} + \frac{0.02Pp_A^S}{0.34} = 0 \quad (4.10)$$

$$Pp_A^S = \frac{0.44a + 0.1524Pt_A^S}{0.0956} \quad (4.11)$$

To maximize profit the theater price of company A will be defined as:

$$\frac{\partial \Pi_A^S}{\partial Pt_A^S} = 0 \quad (4.12)$$

$$2a - 3.72Pt_A^S + 0.18Pp_A^S + \frac{0.2a}{0.34} + \frac{0.02Pp_A^S}{0.34} + \frac{0.04Pt_A^S}{0.34} + 0.18Pp_A^S + \frac{0.01Pp_A^S}{0.34} = 0 \quad (4.13)$$

$$Pt_A^S = \frac{0.88a + 0.1524Pp_A^S}{1.2248} \quad (4.14)$$

In this scenario the prices and profit of both companies will be:

$Pt_A^S = 1.612a$; $Pp_A^S = 7.172a$

$Pt_B^S = 0$; $Pp_B^S = 5.525a$

$$\Pi_A^S = 6.724a^2 - F - C$$

$$\Pi_B^S = 10.378a^2 - F$$

The platform price of company A is bigger than the platform price of company B. On the contrary the profit of company A is smaller than the profit of company B irrespective of the specific value "C"

4.1.2 Day-and-Date by company A (TD,P branch)

If company A chooses to release its content using a "day-and-date" strategy its profit function will be defined as:

$$\Pi_A^D = 2\left(a - 0.93Pt_A^D + 0.18Pp_A^D + 0.1\left(\frac{a + 0.1\left(Pp_A^D + Pt_A^D\right)}{0.34}\right)\right) * Pt_A^D + 2\left(a - 0.17Pp_A^D + 0.18Pt_A^D + 0.1\left(\frac{a + 0.1\left(Pp_A^D + Pt_A^D\right)}{0.34}\right)\right) * Pp_A^D \quad (4.15)$$

To maximize profit the platform price of company A will be defined as:

$$\frac{\partial \Pi_A^D}{\partial Pp_A^D} = 0 \quad (4.16)$$

$$0.36Pt_A^D + \frac{0.02Pt_A^D}{0.34} + 2a - 0.68Pp_A^D + 0.36Pt_A^D + \frac{0.2a}{0.34} + \frac{0.02Pt_A^D}{0.34} + \frac{0.04Pp_A^D}{0.34} = 0 \quad (4.17)$$

$$Pp_A^D = \frac{0.88a + 0.2848Pt_A^D}{0.1912} \quad (4.18)$$

To maximize profit the theater price of company A will be defined as:

$$\frac{\partial \Pi_A^D}{\partial Pt_A^D} = 0$$

(4.19)

$$2a - 3.72Pt_A^D + 0.36Pp_A^D + \frac{0.2a}{0.34} + \frac{0.02Pp_A^D}{0.34} + \frac{0.04Pt_A^D}{0.34} + 0.36Pp_A^S + \frac{0.02Pp_A^D}{0.34} = 0$$

(4.20)

$$Pt_A^D = \frac{0.88a + 0.2848Pp_A^D}{1.2248}$$

(4.21)

In this scenario the prices and profit of both companies will be:

$Pt_A^D = 2.737a$; $Pp_A^D = 8.679a$

$Pt_B^D = 0$; $Pp_B^D = 6.299a$

$\Pi_A^D = 14.773\, a^2 - F - C$

$\Pi_B^D = 13.490a^2 - F$

In this case the platform price of company A is bigger than the platform price of company B. Likewise, the profit of company A is bigger than the profit of company B under the condition where "C" remains smaller than 1.283 a^2.

4.2 Sequential release by company B

If company B chooses to launch its movies sequentially its profit function will be defined as:

$$\Pi_B = 2\ a - 0.93Pt_B + 0.09Pp_B + 0.1Pp_A + 0.1Pt_A) * Pt_B + a - 0.17Pp_B + 0.18Pt_B + 0.1Pp_A + 0.1Pt_A) * Pp_B$$

(4.22)

To maximize profit the platform price of company B will be defined as:

$$\frac{\partial \Pi_B}{\partial Pp_B} = 0$$

(4.23)

$$0.18Pt_B + a - 0.34Pp_B + 0.18Pt_B + 0.1Pp_A + 0.1Pt_A = 0$$

(4.24)

$$Pp_B = \frac{18Pt_B + 50a + 5Pp_A + 5Pt_A}{17}$$

(4.25)

To maximize profit the theater price of company B will be defined as:

$$\frac{\partial \Pi_B}{\partial Pt_B} = 0$$

(4.26)

$$2a - 3.72Pt_B + 0.18Pp_B + 0.2Pp_A + 0.2Pt_A + 0.18Pp_B = 0$$

(4.27)

$$Pt_B = \frac{50a + 5Pp_A + 5Pt_A + 9Pp_B}{93}$$

(4.28)

The prices for both channels of company B will be defined as:

$$Pp_B = \frac{185(10a + Pp_A + Pt_A)}{473}$$

(4.29)

$$Pt_B = \frac{1300a + 130p_A + 130Pt_A}{1419}$$

(4.30)

To find the optimal strategy for company A we integrate the optimal platform price and optimal theater price of company B into the profit function of company A for each possible scenario:

4.2.1 Platform release by company A (P,TS branch)

If company A chooses to release it content only on the platform its profit function will be defined as:

$$\Pi_A^P = 2\left(a - 0.17Pp_A^P + 0.1\left(\frac{185(10a + Pp_A^P)}{473}\right) + 0.1\left(\frac{1300a + 130Pp_A^P}{1419}\right)\right) * Pp_A^P - F$$

(4.31)

To maximize profit the platform price of company A will be defined as:

$$\frac{\partial \Pi_A^P}{\partial Pp_A^P} = 0$$

(4.32)

$$2a - 0.68Pp_A^P + \frac{370a}{473} + \frac{74Pp_A^P}{473} + \frac{260a}{1419} + \frac{52Pp_A^P}{1419} = 0$$

(4.33)

In this scenario the prices and profit for both companies are:

$Pt_A^P = 0;\ Pp_A^P = 6.090a$

$Pt_B^P = 1.474a;\ Pp_B^P = 6.293a$

$\Pi_A^P = 9.030\,a^2 - F$

$\Pi_B^P = 7.436\,a^2 - F - C$

The platform price of company A is smaller than the platform price of company B and the profit of company A is bigger than the profit of company B irrespective of the specific value of "C".

4.2.2 Sequential release by company A (TS,TS)

If company A chooses to release its content on both channels using a sequential strategy its profit function will be defined as:

$$\Pi_A^S = 2\left(a - 0.93Pt_A^S + 0.09Pp_A^S + 0.1\left(\frac{185(10a + Pp_A^S + Pt_A^S)}{473}\right) + 0.1\left(\frac{1300a + 130Pp_A^S + 130Pt_A^S}{1419}\right)\right) * Pt_A^S + \left(a - 0.17Pp_A^S + 0.18Pt_A^S + 0.1\left(\frac{185(10a + Pp_A^S + Pt_A^S)}{473}\right) + 0.1\left(\frac{1300a + 130Pp_A^S + 130Pt_A^S}{1419}\right)\right) * Pp_A^S$$

(4.34)

To maximize profit the platform price of company A will be defined as:

$$\frac{\partial \Pi_A^S}{\partial Pp_A^S} = 0$$

(4.35)

$$0.18Pt_A^S + \frac{37Pt_A}{473} + \frac{26Pt_A^S}{1419} + a - 0.34Pp_A^S + 0.18Pt_A^S + \frac{185a}{473} + \frac{37Pp_A^S}{473} + \frac{18.5Pt_A^S}{473} + \frac{130a}{1419} + \frac{26Pp_A^S}{1419} + \frac{13Pt_A^S}{1419} = 0$$

(4.36)

$$Pp_A^S = \frac{105200a + 35817Pt_A^S}{17273}$$

(4.37)

To maximize profit the theater price of company A will be defined as:

$$\frac{\partial \Pi_A^S}{\partial Pt_A^S} = 0$$

(4.38)

$$2a - 3.72Pt_A^S + 0.18Pp_A^S + \frac{370a}{473} + \frac{37Pp_A^S}{473} + \frac{74Pt_A^S}{473} + \frac{260a}{1419} + \frac{26Pp_A^S}{1419} + \frac{52Pt_A^S}{1419}$$
$$+ 0.18Pp_A^S + \frac{18.5Pp_A^S}{473} + \frac{13Pp_A^S}{1419} = 0$$

(4.39)

$$Pt_A^S = \frac{210400a + 35817Pp_A^S}{250234}$$

(4.40)

In this scenario the prices and profit for both companies are:

$Pt_A^S = 2.435a;\ Pp_A^S = 11.140a$

$Pt_B^S = 2.160;\ Pp_B^S = 9.221a$

$\Pi_A^S = 11.871\ a^2 - F - C$

$\Pi_B^S = 15.961\ a^2 - F - C$

The platform price as well as the theater price is bigger for company A. In terms of profit, company B's profitability is bigger irrespective of the specific value of "C".

4.2.3 Day-and-date release by company A (TD,TS branch)

If Company A chooses to release its content on both channels using a "day-and-date" strategy the profit function will be defined as:

$$\Pi_A^D = 2\left(a - 0.93Pt_A^D + 0.18Pp_A^D + 0.1\left(\frac{185(10a + Pp_A^D + Pt_A^D)}{473}\right) + 0.1\left(\frac{1300a + 130Pp_A^D + 130Pt_A^D}{1419}\right)\right) * Pt_A^D + 2\left(a - 0.17Pp_A^D + 0.18Pt_A^D + 0.1\left(\frac{185(10a + Pp_A^D + Pt_A^D)}{473}\right) + 0.1\left(\frac{1300a + 130Pp_A^D + 130Pt_A^D}{1419}\right)\right) * Pp_A^D$$

(4.41)

To maximize profit the platform price of company A will be defined as:

$$\frac{\partial \Pi_A^D}{\partial Pp_A^D} = 0$$

(4.42)

$$0.36Pt_A^D + \frac{37Pt_A^D}{473} + \frac{26Pt_A^D}{1419} + 2a - 0.68Pp_A^D + 0.36Pt_A^D + \frac{370a}{473} + \frac{74Pp_A^D}{473} + \frac{37Pt_A^D}{473} + \frac{260a}{1419} + \frac{52Pp_A^D}{1419} + \frac{26Pt_A^D}{1419} = 0$$

(4.43)

$$Pp_A^D = \frac{8(13150a + 4049Pt_A^D)}{17273}$$

(4.44)

To maximize profit the theater price of company A will be defined as:

$$\frac{\partial \Pi_A^D}{\partial Pt_A^D} = 0$$

(4.45)

$$2a - 3.72Pt_A^D + 0.36Pp_A^D + \frac{370a}{473} + \frac{37Pp_A^D}{473} + \frac{74Pt_A^D}{473} + \frac{260a}{1419} + \frac{26Pp_A^D}{1419} + \frac{52Pt_A^D}{1419} + 0.36Pp_A^D + \frac{37Pp_A^D}{473} + \frac{26Pp_A^D}{1419} = 0$$

(4.46)

$$Pt_A^D = \frac{8(13150a + 4049Pp_A^D)}{125117}$$

(4.47)

In this scenario the prices and profit for both companies are:

$Pt_A^D = 4.699a$; $Pp_A^D = 14.902a$

$Pt_B^D = 2.712a$; $Pp_B^D = 11.578a$

$\Pi_A^D = 29.066\, a^2 - F - C$

$\Pi_B^D = 25.163\, a^2 - F - C$

In this scenario the company A has the bigger prices for both channels as well as the greater profit irrespective of the specific value of "C".

4.3 Day-and-date release by company B

If companies B will choose to launch its movies using a “day-and-date” strategy the profit function of platform B will be defined as:

$$\Pi_B = 2\ a - 0.93Pt_B + 0.18Pp_B + 0.1Pp_A + 0.1Pt_A) * Pt_B + 2\ a - 0.17Pp_B + 0.18Pt_B + 0.1Pp_A + 0.1Pt_A) * Pp_B$$

(4.48)

To maximize profit the platform price of company B will be defined as:

$$\frac{\partial \Pi_B}{\partial Pp_B} = 0$$

(4.49)

$$0.36Pt_B + 2a - 0.68Pp_B + 0.36Pt_B + 0.2Pp_A + 0.2Pt_A = 0$$

(4.50)

$$Pp_B = \frac{18Pt_B + 50a + 5Pp_A + 5Pt_A}{17}$$

(4.51)

To maximize profit the theater price of company B will be defined as:

$$\frac{\partial \Pi_B}{\partial Pt_B} = 0$$

(4.52)

$$2a - 3.72Pt_B + 0.36Pp_B + 0.2Pp_A + 0.2Pt_A + 0.36Pp_B = 0$$

(4.53)

$$Pt_B = \frac{50a + 5Pp_A + 5Pt_A + 18Pp_B}{93}$$

(4.54)

The prices on both channels will be:

$$Pp_B = \frac{185(10a + Pp_A + Pt_A)}{419}$$

(4.55)

$$Pt_B = \frac{1750a + 175Pp_A + 175Pt_A}{1257}$$

(4.56)

To find the optimal strategy for company A we integrate the optimal platform price and the optimal theater price of company B into the profit function of company A for each possible scenario:

4.3.1 Platform release by company A (P,TD branch)

If company A chooses to release its content only on the platform its profit function of will be defined as:

$$\Pi_A^P = 2\left(a - 0.17Pp_A^P + 0.1\left(\frac{185(10a + Pp_A^P)}{419}\right) + 0.1\left(\frac{1750a + 175Pp_A^P}{1257}\right)\right) * Pp_A^P$$

(4.57)

To maximize profit the platform price of company A will be defined as:

$$\frac{\partial \Pi_A}{\partial Pp_A} = 0$$

(4.58)

$$2a - 0.68Pp_A^P + \frac{370a}{419} + \frac{74Pp_A^P}{419} + \frac{350a}{1257} + \frac{70Pp_A^P}{1257} = 0$$

(4.59)

In the scenario the prices and profits for both companies will be:

$Pt_A^P = 0;\ Pp_A^P = 7.062a$

$Pt_B^P = 2.375a;\ Pp_B^P = 7.533a$

$\Pi_B^P = 11.162a^2 - F$

$\Pi_B^P = 16.906a^2 - F - C$

The platform B has a bigger price for platform channels, is the only company launching in the theater channels and also has a bigger profit compared to company A under the condition where "C" remains smaller than 5.744 a^2.

4.3.2 Sequential release by company A (TS,TD branch)

If company A chooses to launch its movies in both channels using a sequential strategy its profit will be defined as:

$$\Pi_A^S = 2\left(a - 0.93Pt_A^S + 0.09Pp_A^S + 0.1\left(\frac{185\left(10a + Pp_A^S + Pt_A^S\right)}{419}\right) + 0.1\left(\frac{1750a + 175Pp_A^S + 175Pt_A^S}{1257}\right)\right) * Pt_A^S + \left(a - 0.17Pp_A^H + 0.18Pt_A^S + 0.1\left(\frac{185(10a + Pp_A^S + Pt_A^S)}{419}\right) + 0.1\left(\frac{1750a + 175Pp_A^S + 175Pt_A^S}{1257}\right)\right) * Pp_A^S$$

(4.60)

To maximize profit the platform price of company A will be defined as:

$$\frac{\partial \Pi_A^S}{\partial Pp_A^S} = 0$$

(4.61)

$$a - 0.34Pp_A^S + 0.18Pt_A^S + \frac{185a}{419} + \frac{37Pp_A^S}{419} + \frac{18.5Pt_A^S}{419} + \frac{175a}{1257} + \frac{35Pp_A^S}{1257} + \frac{17.5Pt_A^S}{1257} + 0.18Pt_A^S + \frac{37Pt_A^S}{419} + \frac{35Pt_A^S}{1257} = 0$$

(4.62)

$$Pp_A^S = \frac{99350a + 33576Pt_A^S}{14069}$$

(4.63)

To maximize profit the theater price of company A will be defined as:

$$\frac{\partial \Pi_A^S}{\partial Pt_A^S} = 0$$

(4.64)

$$2a - 3.72Pt_A^S + 0.18Pp_A^S + \frac{370a}{419} + \frac{37Pp_A^S}{419} + \frac{74Pt_A^S}{419} + \frac{350a}{1257} + \frac{35Pp_A^S}{1257} + \frac{70Pt_A^S}{1257}$$
$$+ 0.18Pp_A^S + \frac{18.5Pp_A^S}{419} + \frac{17.5Pp_A^S}{1257} = 0$$

(4.65)

$$Pt_A^S = \frac{99350a + 16788Pp_A^S}{109601}$$

(4.66)

In the scenario the prices and profits for both companies will be:

$Pt_A^S = 3.133a;\ Pp_A^S = 14.539a$

$Pt_B^S = 3.853a;\ Pp_B^S = 12.218a$

$\Pi_A^S = 16.446a^2 - F - C$

$\Pi_B^S = 44.470a^2 - F - C$

In this scenario platform B has a bigger price for the theater channel, but company A has a bigger price for the platform channel. Regardless of the value of "C" company B has a bigger profit than company A.

4.3.3 Day-and-date release by company A (TD,TD branch)

If company A chooses to release its content using a "day-and-date" strategy its profit function will be defined as:

$$\Pi_A^D = 2\left(a - 0.93Pt_A^D + 0.18Pp_A^D + 0.1\left(\frac{185\left(10a + Pp_A^D + Pt_A^D\right)}{419}\right) + 0.1\left(\frac{1750a + 175Pp_A^D + 175Pt_A^D}{1257}\right)\right) * Pt_A^D + 2\left(a - 0.17Pp_A^D + 0.18Pt_A^D + 0.1\left(\frac{185(10a + Pp_A^D + Pt_A^D)}{419}\right) + 0.1\left(\frac{1750a + 175Pp_A^D + 175Pt_A^D}{1257}\right)\right) * Pp_A^D$$

(4.67)

To maximize profit the platform price of company A will be defined as:

$$\frac{\partial \Pi_A^D}{\partial Pp_A^D} = 0$$

(4.68)

$$2a - 0.68Pp_A^D + 0.36Pt_A^D + \frac{370a}{419} + \frac{74Pp_A^D}{419} + \frac{37Pt_A^D}{419} + \frac{350a}{1257} + \frac{70Pp_A^D}{1257} + \frac{35Pt_A^D}{1257} + 0.36Pt_A^D + \frac{37Pt_A^D}{419} + \frac{35Pt_A^D}{1257} = 0$$

(4.69)

$$Pp_A^D = \frac{99350a + 29926Pt_A^D}{14069}$$

(4.70)

To maximize profit the theater price of company A will be defined as:

$$\frac{\partial \Pi_A^D}{\partial Pt_A^D} = 0$$

(4.71)

$$2a - 3.72Pt_A^D + 0.36Pp_A^H + \frac{370a}{419} + \frac{37Pp_A^D}{419} + \frac{74Pt_A^D}{419} + \frac{350a}{1257} + \frac{35Pp_A^D}{1257} + \frac{70Pt_A^D}{1257}$$
$$+ 0.36Pp_A^D + \frac{37Pp_A^D}{419} + \frac{35Pp_A^D}{1257} = 0$$

(4.72)

$$Pt_A^D = \frac{2(49675a + 14963Pp_A^H)}{109601}$$

(4.73)

In this scenario the prices and profits for both Companies are:

$Pt_A^D = 6.762a;\ Pp_A^D = 21.445a$

$Pt_B^D = 5.319a;\ Pp_B^D = 16.869a$

$\Pi_A^D = 44.584a^2 - F - C$

$\Pi_B^D = 84.776a^2 - F - C$

In this scenario company B will have a smaller price for both channels and its profit will be higher than company A regardless of the value of "C".

5. Results

Table 1 - Synthesis of the results for the various scenarios

	Company A	**Company B**
(P,P)	$Pt_A^P = 0$; $Pp_A^P = 4.167a$ $\Pi_A^P = 5.903a^2 - F$	$Pt_B^P = 0$; $Pp_B^P = 4.167a$ $\Pi_B^P = 5.903a^2 - F$
(TS,P)	$Pt_A^S = 1.612a$; $Pp_A^S = 7.172a$ $\Pi_A^S = 6.724a^2 - F - C$	$Pt_B^S = 0$; $Pp_B^S = 5.525a$ $\Pi_B^S = 10.378a^2 - F$
(TD,P)	$Pt_A^D = 2.737a$; $Pp_A^D = 8.679a$ $\Pi_A^D = 14.773a^2 - F - C$	$Pt_B^D = 0$; $Pp_B^D = 6.299a$ $\Pi_B^D = 13.490a^2 - F$
(P,TS)	$Pt_A^P = 0$; $Pp_A^P = 6.090a$ $\Pi_A^P = 9.030a^2 - F$	$Pt_B^P = 1.474a$; $Pp_B^P = 6.293a$ $\Pi_B^P = 7.436a^2 - F - C$
(TS,TS)	$Pt_A^S = 2.435a$; $Pp_A^S = 11.140a$ $\Pi_A^S = 11.871\,a^2 - F - C$	$Pt_B^S = 2.160$; $Pp_B^S = 9.221a$ $\Pi_B^S = 15.961a^2 - F - C$
(TD,TS)	$Pt_A^D = 4.699a$; $Pp_A^D = 14.902a$ $\Pi_A^D = 29.066a^2 - F - C$	$Pt_B^D = 2.712a$; $Pp_B^D = 11.578a$ $\Pi_B^D = 25.163a^2 - F - C$
(P,TD)	$Pt_A^P = 0$; $Pp_A^P = 7.062a$ $\Pi_A^P = 11.162a^2 - F$	$Pt_B^P = 2.375a$; $Pp_B^P = 7.533a$ $\Pi_B^P = 16.906a^2 - F - C$
(TS,TD)	$Pt_A^S = 3.133a$; $Pp_A^S = 14.539a$ $\Pi_A^S = 16.446a^2 - F - C$	$Pt_B^S = 3.853a$; $Pp_B^S = 12.218a$ $\Pi_B^S = 44.470a^2 - F - C$
(TD,TD)	$Pt_A^D = 6.762a$; $Pp_A^D = 21.445a$ $\Pi_A^D = 44.584a^2 - F - C$	$Pt_B^D = 5.319a$; $Pp_B^D = 16.869a$ $\Pi_B^D = 84.776a^2 - F - C$

Source: Autor's own elaboration

The table above presents a summary of the prices and profits of companies A and B on different scenarios.

If company A is rational and takes into consideration the actions of company B, with "C" smaller than approximately $38.681a^2$ the strategy that assures company A the best profit is to release the movies on both channels using a day-and-date strategy. Irrespective of company B's decision, this strategy consistently guarantees the highest level of profit when compared to alternative scenarios.

Given that company A decides to launch the movies using the same-day strategy, for the same value of "C" company B will maximize its profit by also following the same strategy. This enables both companies to operate within their optimal scenarios, thereby maximizing profitability. The profit of the second company to enter the market will be higher than the first company, this result could be anticipated since company B has the ability to offer a reduced price compared to company A and, given the substitutability between the movies produced by both companies, this can sway certain consumers towards favoring this OTT service. Some clients may be willing to exchange its subscription or movie ticket of company A for the cheaper products of company B.

In the event that the expenses associated with the theatrical release of the film are elevated and "C" takes on a value greater than approximately $38.681a^2$ the best alternative for company A is to launch its movies exclusive in the platform. Considering this choice, for the same value of "C", company B maximizes its profit by following the same strategy as company A. This strategy also gives customers the best platform price for both companies (the price would be 4.167a in both platforms), however does not allow them the possibility of choosing to watch the film in the cinema. This result also meets expectations as there is always a cost that makes the option of releasing the film in the theater unprofitable.

This suggests that, as anticipated, companies must tailor their strategies in response to the costs associated with cinema releases. In cases of substantial theater costs, box-office revenues may not offer sufficient compensation.

We can observe that companies' profit increases with the opening of new channels and likewise the platform and theater prices also increase. The choice to release the film in the cinema increases the price of the platform compared to the scenario in which there is an exclusive release on the platform.

If cinemas were to differentiate the price of tickets based on the cost per ticket imposed by the producers (theater price) then the setting that would assure the best price for consumers that choose to watch the movies on the big screen would be if company A only launched its movies on the platform and company B followed a sequential strategy (the price of theatrical release for company B would be 1.474a). As the vast majority of theaters maintain the same ticket price regardless of the producers' decisions, this would only mean a higher margin for the cinemas, they would earn more with each ticket sold.

6. Conclusion

In recent years there has been an exponential growth in the number of OTT streaming platforms, with an increasing number of emerging enterprises entering this dynamic market. This relatively recent form of entertainment still offers a multitude of unexplored aspects that can be analyzed, there is an absence of a one-size-fits-all formula for success among these platforms and different business models prove to be profitable. As far as content distribution strategies are concerned, there are also different strategies that companies have been adopting. Those strategies have even been customized to cater to the evolving requirements and needs of consumers.

The purpose of this dissertation was, after describing the distribution strategies used by streaming platforms, to evaluate which strategies are most profitable for companies and what are the implications of the strategies for consumers. In this sense, an analytical model was developed that seeks to replicate, through a system of sequential decisions, a price competition game between two streaming companies. Companies A and B, two OTT platforms that make rational decisions while taking into account each other's actions, all in pursuit of maximizing their individual outcomes. The demand and profit functions of the companies were described for two markets (theater and platform) and analyzed in different scenarios.

From the results obtained, it is possible to concluded that depending on the launch costs for cinema, the best strategy to be followed by companies varies. When launch costs for cinemas are above a certain amount, it is more profitable for companies to launch content exclusive on the platform but otherwise the best strategy is for OTTs to use both distribution channels and simultaneously release to theater and platform. Compared to a holdback period of one month the "day-and-date" proved to be more profitable no matter the decision of the competitors. The price charged by platforms also varies depending on the strategies, with more open channels the price for users tends to be higher.

The "day-and-date" strategy was one of the most adopted during the pandemic period, but with the return to normality, the majority of platforms still prefer a sequential strategy. Although there are, at the moment, still many agreements to keep films in the cinema exclusively for a determinate amount of time, this period has reduced immensely compared to previous years. Until recently theaters were able to maintain a 90-day exclusive window for the most part but there are currently agreements for windows as short as 17 days

(Ahouraian, 2021). With this reduction in holdback between channels, it is possible that we are moving towards a greater preference for strategies where films are released simultaneously.

Studies show that smaller distribution channels are beneficial for movie producers (Lehmann & Weinberg, 2000) but there are not much in-depth studies for the outcomes of "day-and-date" strategies, even if these may be seen as profitable in some scenarios (August et al., 2015).

For further investigation a few alterations could be made to the model which could make it more complex but closer to an accurate representation of reality.

First it is desire to evaluate different companies with different revenue structure in other to apply this model to streaming platforms with different business models the profit function could be altered to accommodate companies with an advertisement based revenue or even companies with mixed strategies, which seems to be the direction companies are following at the moment (Lawrence, 2022; Mulla, 2022) Modifying the model to accommodate those differences between companies may be an interesting extension to this work.

The definition of the model's estimates can also change the obtained result, if, for example, we change the degree of substitutability between cinema and platforms or between the companies themselves it can potentially alter the outcomes.

Another way the model could be improved is by restructurings the demand function. The definition of two demand functions, differentiating the first and second period would be essential to address a potential limitation in the presented model. The model elaborated assumed uniform demand across both periods, a presumption that may not align with real-world conditions. Despite the relatively short time interval considered between periods (one month), fluctuations in demand can occur. The changes in demand are particularly relevant in the cinema market as the number of people going to the cinema, leading to a decrease of the sales rate specially with the release of the movie in a new channel (Lehmann & Weinberg, 2000). It would be relevant to represent the decline in demand specific to this market.

Finally, it is hoped that this dissertation will made a valuable contribution to the existing literature on OTT streaming platforms and their business models, providing insights into their decision-making regarding movie distribution strategies.

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