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The Video Streaming Subscription Industry and Consumer Choices

by

Gabrielle Nicole Chivatero

An Honors Capstone

submitted in partial fulfillment of the requirements

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Dedication:

To my family, without whom I never would have made it to or through this amazing experience. Thank you for four years of home-cooked freezer meals, seven-hour drives, and late-night calls.

Abstract

Consumption of video media has changed drastically in recent years. This paper attempts to analyze consumer choices and provide insight into the direction this industry may go. It utilizes an overview of relevant literature, a theoretical model, and an empirical study. It concludes that it is very likely that the industry will ultimately utilize the same bundle formatting as cable, and that original content and lack of ads are the most important factors in the minds of consumers. Long term, the industry will likely settle into a relatively similar status quo to the pre-streaming era.

Introduction

One of the phenomena of the past decade has been ‘cord-cutting’: eliminating expensive traditional television subscriptions in favor of cheaper, more convenient online streaming services. But as the streaming market bloats with more and more competitors, some wonder if it will not result in a similar product to what consumers were trying to avoid in the first place: buying huge, pricey ‘bundles’ of services to ensure adequate coverage of desired programs and eliminate the complexities of keeping track of multiple monthly subscriptions -- even if that means paying for things they did not want or need. There are a few key differences in the streaming market: a variety of potential access points, password sharing between friends instead of following the household-only rules set by the providers, the constant security battle against piracy, VPNs, and advertisement blockers, all affect the likelihood that streaming will follow the same path as traditional television. This paper will begin by looking at the differences and similarities of the two sectors and present the video streaming subscription market thus far, as well as attempt an analysis of where video streaming subscriptions may go. To further this analysis, the paper will also present analysis of consumer choices using both a theoretical and empirical approach.

Chapter One: Context of the Industry

Streaming is not the first potential competitor to the original cable. Satellite television also at one point had the potential to shake up the industry, although it is now often put in the same box as cable by consumers. One model from 2010 concluded that consumers were generally better off when satellite was introduced to a previously cable-only area, as in order to compete, cable companies had to improve pricing, quality, or both (Chu, 763). That suggests that even if streaming moves to a more similar pricing structure to traditional television, consumers will still ultimately be better off as competition breeds improvement. So far, this does seem to be the case, as traditional television has been moving more and more towards offering online companions to their traditional services, such as allowing streaming of certain programs, whether live or on demand for added convenience. One would also expect to see eventual improvements in price and quality due to the increased competition, although the magnitude of such improvements is yet to be determined; quality pressure is also affected by the availability of high speed internet, another intersecting sector that has been highly influenced by the streaming market.

Video streaming services are inherently reliant on access to high speed internet and devices capable of accessing streaming services. While most consumers will already own a personal computing device capable of accessing this type of service, not all services are available on PCs, and if consumers want to see their content on a screen as big as the television screens they are used to, they must invest in another gadget. This may be a cord that connects their computer to their television, a device that grants a traditional television the ability to access these services (e.g. a Roku), or even a television with 'smart' features built in (e.g. apps and internet

connectivity). These devices add to the cost of these subscriptions; devices do not last forever, and even if hardware did not break, software would become outdated. 71% of households in the US that have broadband own at least one device to aid in accessing these services, but not every service is available on every device (Top 10). Companies like Amazon, who have both a subscription service (Prime Video) and an video streaming subscription Entertainment Device (the Amazon Fire Stick), have an advantage. (Not to mention their built-in platform for selling said items to consumers.)

Supporting the decision by traditional companies to offer online companions, another study analyzed factors thought to predict the likelihood of cord-cutting in favor of streaming services (Tefertiller). While “a variety of gratifications, factors related to technical audience activity, and media substitution factors” did seem to go into the decision, it was primarily the “perceived advantages” (*not* actual advantages, necessarily) over cable that factored in (Tefertiller). This results ideally in giving consumers the best of both worlds, but also brings up the question of whether consumers will continue to switch over to streaming as rapidly if they are faced with an increasingly complex market.

Peacock is one such online companion, being released by NBC/Comcast in April 2020 (Sharma and Flint). Within the next year and a half, it is scheduled to take in some of the most classic shows to stream, such as *The Office* (Sharma and Flint). But it also pulls in one of the less desirable aspects of cable: It will have ads for the consumers who get it for free through their pre-existing Comcast subscription, and likely even for those who pay a subscription fee to gain access, although as of November 2019, the company had still not committed to a strategy (Sharma and Flint). This could be a turning point in the industry. Comcast is a very powerful

company, one of the first of their kind to majorly delve into the video streaming subscription industry, and their competitors will likely follow their lead. Thus, the future of these online companions will rest firmly on Peacock's shoulders.

One of the biggest advantages most streaming services had over traditional television was that there was no advertising; the subscription fee was touted as the only cost. Even Hulu, who was well known at its inception for its advertisement-only option, ended the service in 2016, showing how the market was tending strongly towards primarily subscription fees (FCC 66). But as giants such as Netflix and newcomers like Peacock consider adding full-on advertisements into their business models (having long ago started making use of 'invisible' sponsorships within their original content, allowing brands to pay to have their products heavily visually featured), how will that affect the market? Since Tefertiller found that perceived advantages were the most important factor in cord-cutting, we would expect the addition of ad breaks to ultimately have a very negative impact on the streaming industry versus the dual traditional television with ad breaks/video streaming without ad breaks mechanism now used by many traditional companies.

Still, ad-based video streaming subscription services are on the rise. In 2018, 24% of US broadband households accessed ad-based video streaming subscription services, but in 2019, nearly one third did so (Nason). There are a few different possible explanations for this increase, the obvious one being that given the amount of money consumers are paying for other video streaming subscription services, consumers are willing to put up with ads in order to avoid forking out any more money, and indeed, over half of those who use these services cite no monthly payment as a key factor in their decision to use the services (Nason). Another possibility, though, is that many of these consumers may be using an advertisement blocking

service. These services, usually internet browser ‘add-ons’, are generally free, and are constantly being updated in attempts to thwart the monetization of consumer attention. It is a constant battle; at any given moment, either side could be winning, but whenever the other updates, the balance can shift. At their most successful, ad blockers prevent ads from being shown without the would-be advertisers even knowing about their own failure.

Piracy is one of, if not *the*, most stereotypical ways that media companies lose revenue. But unlike historical, rowdy, ne'er do well pirates, modern media pirates care primarily about convenience. When streaming services first started, the convenience led to a decrease in the amount of piracy, but now that there is so much exclusive content across so many different platforms, piracy is actually *resurging* because it is impossible for even the best-intentioned consumers to subscribe to *every* video streaming service. However, this indicates that while piracy *is* an issue, it is probably a better business plan to focus on reaching consumers in the most convenient way possible; given the historical relationship between piracy and convenience, we would expect to naturally decrease piracy. If a clear solution to content piracy existed, it probably would have been discovered by the more traditional media companies who have been dealing with it since the dawn of the internet, and even, to a lesser extent, with the previous advent of CD and VHS ripping. Since it is very well documented that piracy and convenience are correlated, and convenience is a lot more within the control of legal video streaming services than coming up with a novel solution to a years-old problem, changing the focus away from piracy as an issue would actually likely have a better effect than directly attacking piracy.

Disney now holds three of the top ten video streaming subscription Video Services spots according to Parks Associate, as they own Hulu, Disney+, and ESPN (Sharma and Flint). While

hundreds of streaming services exist, this suggests that the market is not quite as fractured as it seems. According to The Wall Street Journal, “Americans are willing to spend an average of \$44 monthly on streaming video and subscribe to an average of 3.6 services... up roughly \$14 from what most people pay now”, which indicates that there is more room for growth. However, if many of the major streaming services are owned by the same parent company, e.g. Disney, they can play around with different pricing structures, such as bundling, to maximize their share of these \$44. Disney has already experimented with bundling using Hulu, one of their subsidiaries, and Spotify, an unaffiliated music streaming service; they have offered a \$5 discount for bundling to any consumer, and \$13 for students (Reisinger). Now that they have so many streaming services of their own, they can go even further.

Channel surfing is an outdated pastime; today’s consumers want to sit down and watch a specific thing that they are interested in. According to Parks Associates, the “top three reasons why consumers would recommend their [video streaming] service are content variety, ease of content discovery, and good original programming” (Content Variety). While just about every service offers at least some level of recommendation based on previous viewings, many websites have also popped up to assist consumers in consuming media via streaming services. One of the originals, canistreamit.com, was popular primarily before the advent of original programming. It focused on allowing users to input the title of a TV show or movie and spitting out a list of places it could be streamed. Now, even the ubiquitous imdb.com has integrated this feature into its website, and one of the most popular standalone sites is aptly named decider.com: it focuses on discovering content based on the streaming services that users subscribe to in order to help them decide what to watch - and where.

While peer-to-peer recommendations are powerful factors in the decision to subscribe to a new streaming service, experiencing the service for themselves may be even more so: over half “of US broadband households that subscribed to an OTT video service within the past year indicate that the service trial played a key role in their subscription decision” (Free Trial). Consumers care about their experience, and if they do not like it, they have few qualms about cancelling. There are nearly three hundred options available; there is no reason to stick with one that does not meet expectations (Free Trial).

With so many new streaming services launching, subscriber retention is on the minds of every top executive. The natural place to look for solutions is, of course, the subscriber base itself. The top five methods that consumers claim would have had them reconsider cancelling an subscription include a lower price for a service with fewer programs, the ability to put the subscription on hold, keeping prices frozen to the price the consumer originally agreed to pay, a complimentary upgrade to a better tier of subscription, or a one dollar per month discount (Parks Associate 2nd Annual). But there are a few problems with these methods from a company’s perspective. To begin, simply look to their predecessors, the cable/internet/phone bundle providers. The standard procedure for many people is to call every single year and threaten to cancel, scaring their provider into offering a better rate for a period of time. That’s a hassle that streaming companies don’t want to deal with, and as long as there are so many players on the field, it’s dangerous to have subscribers regularly think about canceling, even if they only say it to get a better rate. Having a lower price for a service with fewer programs makes perfect sense, and it is something that is already being tried: Apple’s ‘TV+’ is only \$4.99 a month, but is also starting with a mere *nine* shows (Sharma and Flint). Compare that to Disney+’s 7,500 TV episodes and 500 movies for only \$6.99 a month (Sharma and Flint). For only two more dollars a

month, consumers can get, functionally speaking, nearly infinitely more content. Creating original programming is expensive, so prices can only go so low, but how is it possible to compete with thousands of hours of beloved programming and competitors with pockets so deep they don't even care about making a profit until 2024? (Sharma and Flint) At the end of the day, it could come down to pure resources. Netflix has the incumbent position with the biggest subscriber base to draw on and a long headstart on popular original programming, Disney has multiple successful streaming services with decades of content and a dragon's hoard of capital... the stage may already be set. Apple has the advantage of not *needing* their service to work out, as it isn't their core business, but for the dozens of smaller streaming services that are *only* streaming services, the next few months are likely to make it or break it. Seventy-two of the streaming services available in the United States have less than 20,000 subscribers (Percent). With more and more major players crowding the field, these services are extremely likely to be crowded out in the next year and a half. If, as mentioned earlier, American consumers are on average only willing to subscribe to 3.6 video streaming services, the more high profile services encroach (e.g. Disney+, Peacock, and even Apple TV+ with their brand recognition versus Netflix, Hulu, and Amazon Prime), the less likely it is that lesser known services will be able to compete.

Far from giving subscribers the option to put their subscriptions on hold in order to prevent permanent cancellations, Netflix is actually testing out giving discounts for those willing to commit to a longer subscription in a single payment: as low as half off if Indian subscribers commit to a full year (Smith). While it is just in its testing stages, and not yet available in the United States, it comes on the heels of Disney+ releasing with a similar option, indicating market pressure (Smith). This approach would guarantee a certain level of revenue for a period of time,

although given that no one knows where the industry will go in the next year (the longest period covered by this new deal), it *is* a gamble that in a year's time, subscribers will still be happy enough with the service to pony up a hundred dollars at once to keep it going when they have countless other options. However, if consumers commit to a couple services, other services may die before their current subscriptions need to be renewed, limiting competition.

While most streaming services allow others in the same household to have their own profiles, largely intended to allow couples and children to have unique profiles (which results in much clearer datasets for companies to analyze in order to provide more personalized experiences and market analysis), this is often abused by users who share their passwords with their friends. It is estimated that password sharing costs media giants Netflix \$135 million per month, and Hulu \$1.5 billion per year (Hayat). But that's just in subscription fees; they could be losing much more in terms of pure data loss. Data is one of the biggest resources available, and keeping everyone's information separate allows algorithms to do much more accurate analysis.

Between accounting sharing and piracy, Parks Associates forecasts a loss of over nine billion dollars in the industry's revenue overall. They also say that "27% of US broadband households engage in some form of piracy or account sharing"; this is not a minor issue for media companies (Forecasts). However, it is also probably not a sign of excessive moral failure in the US. According to Brett Sappington, a leading researcher in the field, most people who engage in piracy or account sharing *also* subscribe to one or more video streaming services; this indicates that the problem is primarily that media companies are not currently meeting consumer needs, and that this rate will likely naturally decrease as the industry matures and companies figure out exactly what consumers want (Park Associates Forecasts).

One method that Netflix has introduced to combat losses due to account sharing is charging a higher subscription fee to view content on more than one screen at once. Assuming that many people follow fairly similar viewing habits, such as coming home from work, eating dinner, then flicking on Netflix, having multiple people on one account would result in a decent amount of overlap, presumably spurring people to upgrade to a higher tier. While this does not double the price, so it is less profitable than both parties simply getting their own subscriptions, Netflix is still getting more than if the 'leech' had decided the price of Netflix was not worth it and thus moved to piracy.

Chapter Two: Modeling Consumer Choices

Theoretical Modeling

The choices consumers make regarding their subscriptions, while greatly integrated into the literature review preceding this section, can be summarized and thus represented with a consumer utility model (see Equation 1 below). Given the abundance of potential outcomes, it is also a multinomial choice model. Four key factors were chosen for this model: the selection of content, the convenience of the service, whether or not there were ads, and ‘other’. The goal of consumers is to maximize the utility of the sum of these four factors for all the services they choose with respect to the total price not exceeding their budget as the overarching constraint with (i,j) choices for services.

Equation 1

$$\begin{aligned} \text{Max } u \left(\sum x_i \right) &= \sum_{i=1}^j \textit{selection}(x_i) + \sum_{i=1}^j \textit{convenience}(x_i) + \sum_{i=1}^j \textit{ads}(x_i) + \sum_{i=1}^j \textit{other}(x_i) + \varepsilon, \\ &\textit{subject to } \sum p(x_i) = \textit{budget} \end{aligned}$$

Empirical Analysis

In order to add in an empirical approach, I created a survey asking about how people make these choices. They were asked what matters most, how much are they willing to spend, how many do they actually use or subscribe to? I asked them to rank eleven factors in order of how much each factor mattered in making their decision. I have summarized these in a table, along with their corresponding variable names in R Studio.

Table 1

rprice	Cost
rads	Level of advertisements present
rdifficulty	Ease of use/Convenience
roriginal	Original Content
rmovie	Movie Selection
rbinge	Availability of Binging Classics
radditions	How often new content is added
rsports	Availability of sports
rair	How soon live TV appears
rfriends	Whether friends use the same service
rother	Fill-in-the-blank

In order to make sure there were an adequate number of responses, no demographics were collected. This did work: over two hundred usable responses were collected. One bias that is almost certainly present in the data is an increased level of education compared to the general populous given that the survey primarily received responses from two universities and an education forum.

The survey also asked about the number of services they used, as well as the number of services they *paid* for. I ran a regression model for both of these using the eleven factors as linear

variables. These models are shown below; a numerical summary of the results can be found in the appendix.

```
model1 <- lm_robust(data=surveydata, numused ~ rprice + rdifficulty + roriginal
+ rmovie + rbinge + rads + radditions + rsports + rair + rfriends + rother)
```

```
model2 <- lm_robust(data=surveydata, numpaid ~ rprice + rdifficulty + roriginal
+ rmovie + rbinge + rads + radditions + rsports + rair+ rfriends + rother)
```

As expected, both models found significance. Less expectedly, the presence (or lack thereof) of original content and ads stood out as the two most important factors, even above price. This indicates that to stand out in a bloated market, companies should focus on these two things, and might explain why Netflix has stayed on top and why HBO had such luck. Both services lack ads and create popular original content.

But decisions don't happen in a vacuum. Consumers are willing to make trade-offs in some areas. To improve the model, I added an interaction effect between price and ads:

```
model3 <- lm_robust(data=surveydata, numpaid ~ rprice*rads + rdifficulty + roriginal
+ rmovie + rbinge + radditions + rsports + rair + rfriends + rother)
```

```
model4 <- lm_robust(data=surveydata, numused ~ rprice*rads + rdifficulty + roriginal
+ rmovie + rbinge + radditions + rsports + rair + rfriends + rother)
```

When this interaction effect is added, the models fit even better. This appears to be because there is a correlation between price and advertisements; consumers dislike advertisements regardless, but the higher the price, the less likely they are to put up with them.

Conclusion

Only time will tell exactly how this industry will play out; the next year or two will be key. As consumer needs and desires become better studied, the players already at the top will have an advantage as they will have a much larger group to learn from. There will likely be a flurry of different options pop up, ranging from ad-supported to subscription to bundling, and a combination of consumer preferences and sheer ability to wait the chaos out on the part of the bigger companies is liable to decide the ultimate surviving pricing structure and streaming services.

Based on the results of the models in this paper, I suggest that advertisements (at least, blatant ones) may lose favor until an oligopoly forms of companies that waited out the competition. Original content and bundling will be two of the most important factors in determining who survives stage. Ultimately, while the technology has improved, and consumers will be moderately better off, the industry is unlikely to operate much differently than it did before the advent of streaming video services.

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Appendix

Model 1

Standard error type: HC2

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)	CI Lower	CI Upper	DF
(Intercept)	4.8412292	1.47742	3.27681	0.001289	1.92333	7.759131	159
rprice	-0.0070714	0.05194	-0.13615	0.891875	-0.10965	0.095506	159
rdifficulty	0.0058434	0.05153	0.11339	0.909861	-0.09593	0.107619	159
roriginal	-0.1518520	0.04121	-3.68515	0.000313	-0.23323	-0.070469	159
rmovie	-0.0185911	0.04661	-0.39885	0.690540	-0.11065	0.073467	159
rbinge	-0.0194359	0.04372	-0.44453	0.657264	-0.10579	0.066916	159
rads	-0.0805367	0.04147	-1.94188	0.053919	-0.16245	0.001374	159
radditions	0.0486530	0.04115	1.18241	0.238808	-0.03261	0.129919	159
rsports	-0.0430407	0.03772	-1.14095	0.255607	-0.11754	0.031463	159
rair	-0.0541616	0.04365	-1.24078	0.216513	-0.14037	0.032049	159
rfriends	-0.0122783	0.04855	-0.25290	0.800671	-0.10816	0.083607	159
rother	-0.0006624	0.02556	-0.02592	0.979357	-0.05114	0.049818	159

Multiple R-squared: 0.1254 , Adjusted R-squared: 0.06486

F-statistic: 2.126 on 11 and 159 DF, p-value: 0.0213

Model 2

Standard error type: HC2

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)	CI Lower	CI Upper	DF
(Intercept)	2.9167186	1.99415	1.46264	0.1458	-1.02631	6.85975	138
rprice	0.0569038	0.04985	1.14149	0.2556	-0.04167	0.15547	138
rdifficulty	-0.0830026	0.05665	-1.46516	0.1452	-0.19502	0.02901	138
roriginal	-0.0881600	0.03649	-2.41597	0.0170	-0.16031	-0.01601	138
rmovie	0.0161130	0.04435	0.36333	0.7169	-0.07158	0.10380	138
rbinge	0.0093239	0.04464	0.20887	0.8349	-0.07894	0.09759	138
rads	-0.0369342	0.03919	-0.94241	0.3476	-0.11443	0.04056	138
radditions	-0.0165724	0.04085	-0.40566	0.6856	-0.09735	0.06421	138
rsports	-0.0229135	0.04189	-0.54705	0.5852	-0.10573	0.05991	138
rair	-0.0343033	0.04356	-0.78741	0.4324	-0.12044	0.05184	138
rfriends	0.0552288	0.05742	0.96190	0.3378	-0.05830	0.16876	138
rother	-0.0005597	0.03871	-0.01446	0.9885	-0.07710	0.07598	138

Multiple R-squared: 0.1253 , Adjusted R-squared: 0.05563

F-statistic: 2.061 on 11 and 138 DF, p-value: 0.02711

Model 3

Standard error type: HC2

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)	CI Lower	CI Upper	DF
(Intercept)	2.9914088	2.02678	1.47594	0.14225	-1.01641	6.99923	137
rprice	0.0232936	0.10499	0.22187	0.82475	-0.18431	0.23090	137
rads	-0.0597585	0.06109	-0.97823	0.32969	-0.18056	0.06104	137
rdifficulty	-0.0863238	0.05662	-1.52471	0.12964	-0.19828	0.02563	137
roriginal	-0.0886327	0.03657	-2.42385	0.01666	-0.16094	-0.01632	137
rmovie	0.0137821	0.04508	0.30575	0.76026	-0.07535	0.10292	137
rbinge	0.0085481	0.04512	0.18944	0.85003	-0.08068	0.09778	137
radditions	-0.0189118	0.04273	-0.44259	0.65876	-0.10341	0.06558	137
rsports	-0.0182836	0.04289	-0.42632	0.67054	-0.10309	0.06652	137
rair	-0.0333293	0.04393	-0.75875	0.44931	-0.12019	0.05353	137
rfriends	0.0579036	0.05790	1.00001	0.31907	-0.05660	0.17240	137
rother	-0.0007684	0.03908	-0.01966	0.98434	-0.07804	0.07650	137
rprice:rads	0.0074639	0.01729	0.43173	0.66662	-0.02672	0.04165	137

Multiple R-squared: 0.127 , Adjusted R-squared: 0.05055

F-statistic: 1.989 on 12 and 137 DF, p-value: 0.02959

>

Model 4

Standard error type: HC2

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)	CI Lower	CI Upper	DF
(Intercept)	4.9443156	1.50937	3.27574	0.0012953	1.96316	7.92547	158
rprice	-0.0653140	0.09777	-0.66807	0.5050629	-0.25841	0.12778	158
rads	-0.1202791	0.06969	-1.72581	0.0863372	-0.25793	0.01737	158
rdifficulty	0.0013268	0.05283	0.02511	0.9799969	-0.10303	0.10568	158
roriginal	-0.1511350	0.04102	-3.68468	0.0003142	-0.23215	-0.07012	158
rmovie	-0.0206621	0.04691	-0.44050	0.6601738	-0.11330	0.07198	158
rbinge	-0.0203782	0.04400	-0.46313	0.6439076	-0.10728	0.06653	158
radditions	0.0451160	0.04231	1.06634	0.2878980	-0.03845	0.12868	158
rsports	-0.0337243	0.04026	-0.83766	0.4034877	-0.11324	0.04579	158
rair	-0.0521782	0.04364	-1.19555	0.2336638	-0.13838	0.03402	158
rfriends	-0.0095183	0.04916	-0.19361	0.8467294	-0.10662	0.08758	158
rother	-0.0009639	0.02591	-0.03721	0.9703670	-0.05213	0.05020	158
rprice:rads	0.0132697	0.01779	0.74610	0.4567139	-0.02186	0.04840	158

Multiple R-squared: 0.1291 , Adjusted R-squared: 0.06294

F-statistic: 1.923 on 12 and 158 DF, p-value: 0.03521

Fwd: Capstone

Wafa Hakim Orman <who0001@uah.edu>

Wed, May 6, 2020 at 4:17 PM

Reply-To: wafa.orman@uah.edu

To: William Wilkerson <wilkerw@uah.edu>, David Cook <dac0010@uah.edu>, Gabrielle Chivatero <gc0024@uah.edu>

I approve this Honors Capstone project completed by Gabrielle Chivatero.

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 **Capstone Final Document_Chivatero.pdf**
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