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The Streaming Wars: The Future of Entertainment

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Table of Contents

Abstract

The Streaming Wars are the competition between Over-The-Top online streaming services market such as Netflix, Hulu, Disney+, and HBO Max. This paper seeks to analyze the market through a literature review of factors which will influence in the market as well as an empirical analysis on the relationship between Netflix and the cable industry over time and how that relationship has changed. I find that Netflix's revenue growth has had a negative impact on the cable industry's revenue growth, but that relationship has diminished over time. I interpret this as a new market emerging for streaming services where multihoming will play in competition.

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I. Introduction

"I had a big late fee for "Apollo 13." It was six weeks late and I owed the video store $40. I had misplaced the cassette. It was all my fault. I didn't want to tell my wife about it. And I said to myself, "I'm going to compromise the integrity of my marriage over a late fee?" Later, on my way to the gym, I realized they had a much better business model. You could pay $30 or $40 a month and work out as little or as much as you wanted."

–Reed Hastings (co-founder, Chairman, and CEO of Netflix) (Zipkin 2006)

Since its establishment in 1997, Netflix has disrupted the home entertainment market by providing an alternative method of media consumption to the market. They created a new platform which provided flexibility and cost savings to consumers. The above quote from Hastings describes how the idea of Netflix came to him. Its initial business model of providing customers with an enormous library of entertainment which they could order to watch at their own discretion was unprecedented. Traditionally, customers needed to either pay a single time fee to purchase a movie or pay a smaller fee to rent the movie. Netflix provided consumers with a cheaper, new option which gave them power over their consumption habits.

At first, Netflix was primarily a mail order digital versatile disc (DVD) service where you paid a monthly subscription fee that allowed you to pick movies to watch. This gave consumers flexibility and broad choices to watch movies at their own volition. Traditional methods such as browsing TV channels until you found something you liked or buying movies and building your own personal library did not allow for as much flexibility as Netflix.

Hastings predicted that streaming entertainment online would eventually be more efficient than mailing DVDs around the country (Littleton and Roettgers 2018). Eventually, broadband speeds and streaming technology would reach the point where streaming entertainment online would be efficient enough to offer in the market. In 2007, that time arrived, and Netflix began offering subscribers the option of streaming movies and TV shows online.

The online streaming service gave consumers even more flexibility. It was now far easier to stay at home and consume media through streaming than to go out and buy movies individually. This created a trend of dropping cable/satellite subscriptions, commonly called Cord-Cutting (Newman 2019). Pay TV providers lost in aggregate about 3.2 million subscribers in 2018 from a base of about 80 million subscribers. Already in the first three months of 2019, the industry lost just over 1 million subscribers, showing an increase in the acceleration of cord-cutting (Roettgers 2019). Cord-cutting provides a large saving in costs, more flexibility, and less advertising (Fontaine and Noam 2013). Cable television companies report the average monthly bill costs $85 per month or more while most streaming services will cost about $10 per month (Molina 2017). Depending on what combination of OTT[1] live TV and streaming services are bundled, it can easily cost less than a cable TV subscription (Newman 2019). The drawbacks of cord-cutting are more reliance on high internet speed for bandwidth (which will continue to improve over time with the improvement of network systems) and less availability of live entertainment, such as local news and sports.

[1] Over-The-Top: Over-The-Top media services are streaming media services which are delivered over the internet which bypass cable, broadcast, and satellite services.

Studios are responding to this trend of cord-cutting. Warner Media and The Walt Disney Company, among other studios which used to license their content to Netflix, are releasing their own online subscription video on demand (SVOD) services[2] in late 2019/early 2020. These services will compete with Netflix. They have enormous libraries of content that the studios have been producing for the past century. Perhaps partly in anticipation of such competition, Netflix has ramped up its investments in original content. In November of 2018, three of Netflix's top five most-watched shows were licensed content (Smith 2019). Now that studios are pulling back their content from Netflix, Netflix must invest in their own original content to keep their library robust. See Figure 1 for Netflix's increasing investment in original content. Netflix spent $15 billion on original content in 2018 which compares to Amazon's $6 billion, Apple's $6 billion, AT&T's (Warner Media's) $14.3 billion, and Disney's $23.8 billion (Lovely 2019).

This thesis focuses on how Netflix's relationship with the cable industry has changed over time. Netflix's impact on the entertainment market has been documented, but its change over time has not (Aliloupour 2016). I seek to analyze the change in this relationship and figure out its implications for the streaming wars.

It is important to study the emergence of streaming services because, for Americans, TV is the single biggest use of leisure time. According to the American Time Use Survey, 80% of Americans watch TV on a given day (Wallsten 2015). During 2013-2017, the U.S. civilian noninstitutionalized population ages 15 and older averaged two hours and 46 minutes watching TV per day (Krantz-Kent 2018).

[2] SVOD services are essentially all online services which provide users with wide access to TV and Movies for a subscription fee

I summarize the background of the entertainment market as well as the cable industry. Next, I review the literature on factors which will influence the shape of the entertainment market such as multihoming. I then develop my hypotheses, describe my data, explain my models, and discuss my regression results. I find that the growth of Netflix has had a significant negative impact on the cable industry's growth. Over time, I find this effect has diminished. This might be due to a gradual response by the cable industry to adapt to the new market and develop competition.

II. Industry Background

Netflix entered the home entertainment market in 1997 as a physical rental service that would mail customers their movie in DVD form (Netflix 2019). At the time, video rental stores were the main player in the home entertainment market (Quijano 2017). Netflix's new business model gave consumers more flexibility because people could order their DVDs online without late return fees.

Netflix launched their online streaming service in 2007 (Netflix 2019). In 2014, Netflix provided services to 90% of the OTT video service users in the market. In 2019, Netflix has dropped down to 87% due to the gradual release of other services[3] such as Amazon Prime Video and Hulu (Feldman 2019).

When a disruptor comes into a market, it takes the existing companies a certain amount of time to properly respond (Alsin 2018). My data in addition to the coming release of many streaming services indicates that the response to the initial disruption is starting to happen. Studios are starting to release their own streaming services to compete with Netflix's. Over the past decade, Netflix has had the advantage of expanding into their market with little to no direct competition.

To prepare for this, Netflix has been developing their own original content to help bolster their strength in the market (Trainer 2019). Competition emerged a couple years after Netflix released their platform because user experience interaction needed to be optimized. An example of this is HBO Nordic that was released in 2012. HBO Nordic was a new service released to Nordic areas to provide SVOD services. HBO Nordic ended up performing horribly in comparison to their competition. In 2013, HBO Nordic

[3] See Table 1 for a list of major streaming services.

sat at a mere 17,000 daily consumers while Netflix sat at around 308,000 (Clover 2013). A large amount of HBO Nordic's failure was due to extremely poor user experience. Baran (2015) and Kilkku (2012) describe the poor branding, functionality, and design of the service.

Literature which surrounds Subscription Video on Demand (SVOD) services discusses the cannibalization of cable and other traditional forms of home entertainment. For example, there was a dip in Time Warner Cable's revenue in 2007 which coincidentally was the year which Netflix released its online service (Aliloupour 2016). According to PricewaterhouseCoopers, the number of SVOD subscriptions overtook the number of cable subscriptions in 2017. Leichtman Research Group found that as of 2019, 74% of households have a subscription to Netflix, Amazon Prime, and/or Hulu. This number has grown since 2017 (64%) and 2015 (52%) (Leichtman 2019). In 2017, 73% of households had a cable or satellites television subscription (Carlson 2019). The number of cable subscriptions are expected to decline 5% in 2019, compared to declining 4% in 2018 (Roettgers 2019).

Cable has been a dominant source of television and movies for the past 65 years, shown by its widespread use. It originated in 1948 to help expand the reach of over-the-air television signals (CCTA 2019). The infrastructure continued to expand throughout the 20th century with the industry spending over $15 billion from 1984 through 1992 (CCTA 2019). In the early 2000s, new technologies started to develop such as High-Definition television, Video-on-Demand, and other services which were able to expand the cable industry's reach. Today, there are approximately 2,500 local broadcast stations which reach over 115 million U.S. households (Boik 2016).

Several firms plan to enter the SVOD market in the fall of 2019 and spring of 2020 (See Table 1). This includes HBO Max (Warner Media), Disney+ (Disney), Peacock (NBC Universal), Apple TV+ (Apple), and Quibi (Sharma and Flint 2019). According to a recent phone survey of 1003 people, 22% of respondents indicated they were likely or highly likely to subscribe to Disney+ when it comes out (Qriously 2019). According to many in the industry, these platforms are expected to start a new era in the market and intensify the streaming wars (Sharma and Flint 2019).

There is much speculation about how much has been invested in these services. For example, estimates of the new Marvel TV show's budget ranges from $150-200 million (Clark 2019). Disney is reportedly planning on spending around $1 billion on Disney+ original content, and up to $2.5 billion by 2024 (Levy 2019). This does not incorporate R&D costs, marketing, or the opportunity cost of not licensing out their content.

III. Literature Review

I first review the literature on innovation and how it affects markets. I then delve into multihoming, bundling, platform theory, and how to disrupt an established firm.

A. Innovation

The effects of innovation often determine a firm's success or failure. Talay and Townsend (2015) find that the strongest innovators survive the longest. In conjunction with this, a firm's complacency, or lack of innovative practices, has been found to be detrimental to long-term survival. The Red Queen Hypothesis, where organisms are constantly competing and evolving in the race between predator and prey explains why production studios and cable companies will now be changing the way they distribute. Instead of licensing out their distribution, firms need to gain access to their consumers directly by hosting their content on their own platforms (Talay and Townsend 2015).

Platform businesses are businesses which create value by providing a space to connect consumers and producers (Hagiu 2017). Streaming services are platform businesses because they connect consumers with production studios. A large part of platform business success relies on acquiring a number of users and gathering data on them (Iansiti and Zhu 2019). Streaming platforms will be able to utilize these customer insights to help their other product verticals. Looking forward, direct access to consumers and their data is likely to be increasingly important (Evens 2014). The access to consumers—which streaming services give—allows studios to collect consumer data and preferences. This arguably should allow them to build a better platform which conforms to consumer preferences and better content which should in turn generate more revenue. Netflix has long realized the strength which data and analytics gives them. Their

proprietary recommendation algorithm consistently provides consumers with content which will keep them locked in. They even held a contest for $1 million to the public for anyone who could substantially improve the accuracy of predictions (Venkatraman 2017)

B. Multihoming

Multihoming is the act of using more than one platform in a multi-platform market. Singlehoming is the act of choosing to use just one of the platforms. An example of multihoming would be one household subscribing to Netflix, Hulu, and Amazon Prime Video. Currently, US households have on average 3 paid streaming video prescriptions (Variety 2019). The extent to which consumers decide to multihome will have a significant effect on the streaming market in years to come. If consumers multihome less, then providers must compete more intensely for their users. Once the new wave of streaming platforms hits the market, it will be vital for firms to understand consumer multihoming to determine strategies. Starting in 2019, studios have begun to pull their content from third party distributors. For example, WarnerMedia pulled *Friends* from Netflix (Clark 2019). WarnerMedia's chief content officer, Kevin Reilly, discussed that they were essentially giving Netflix a "club to beat us over the head with" while licensing content out to Netflix and "the biggest and best-known properties of WarnerMedia will be in HBO Max almost exclusively" (Szalai 2019). They were productive with licensing content but did not ever receive data from Netflix. It appears that studios are trying to create platforms with certain design themes and target customers. Markets where platforms have exclusive content are expected to have higher subscription prices due to the lack of necessity to compete over the same good (Anderson, Foros, and Kind 2019). For example, if someone has a child and just wants to provide them with content, they

might just subscribe to Disney+. The Walt Disney Company owns Disney+ as well as fully controls Hulu due The Walt Disney Company agreeing to acquire Comcast's stake in Hulu in March of 2019. The Walt Disney Company aims to target nostalgic, mainstream, and family viewing with Disney+ while Hulu is directed towards an eclectic collection with current television programs (Gates 2019). According to a report by Qriously (2019), the two groups most likely to subscribe to Disney+ are the 18-24 age demographic and households with children. If each platform has a specific target audience which they are trying to reach, this results in less multihoming, which can result in higher subscription prices and therefore higher profit.

C. Bundling

Bundling occurs with streaming services because many TV shows, movies, and documentaries are bundled together into one platform. It is applicable when one considers the reasons why studios are starting to introduce their own streaming services, rather than licensing to third party distributors. Richard Schmalensee (1984) shows that mixed bundling, where products are offered as bundled goods as well as individually is the most profitable. This is compared to pure bundling and unbundled sales. The bundling reduces buyer diversity which enables producers to capture more consumer surplus. In addition to this, bundling serves as a barrier to entry in oligopolistic markets since firms can defend both products without dropping prices as far as they would without bundling (Nalebuff 2004).

D. Platform Theory

Academics have discussed platform theory and different elements which contribute to success (Belleflamme and Peitz 2017). There has been a rise in platform

competition with companies such as Amazon, Etsy, Facebook, and Uber emerging (Kenney and Zysman 2016). One key piece of platform business is attracting users. This is an area in which established entertainment studios such as The Walt Disney Company, WarnerMedia, and NBC have an advantage over Netflix. These companies have been producing content for decades, and there is strong brand recognition. Platform theory proposes that to increase the number of users, firms must offer subsidies, stand out with their technology, or have the first-movers advantage. Netflix has secured a large user base with their first-movers advantage, while studios must rely on their brand recognition and subsidies to grow their user base. The nature of the business means firms must differentiate themselves on user experience rather than their technology (Suarez and Kirtley 2012). Another important aspect of platforms which goes hand in hand with increasing user base is their strength of network effects. Network effects are the phenomenon in which additional users create a meaningful impact and have a snowball like effect in terms of their impact on a platform. Weakening network effects have been shown to weaken a firm's market position (Iansiti and Zhu 2019). I anticipate OTT services will have weak network effects due to the importance of "hits". The total number of shows or movies aren't as important since there are a few specific shows which stand out and are extremely important. This can create a low barrier to entry in the market if a new entrant has one of those hits. Iansiti and Zhu show the combination of low barrier to entry and low barrier to exit for consumers creates weak network effects for the industry. Many OTT platforms have a recommendation product built in which suggests certain shows based on previous consumption habits. This increases the likelihood a user stays with a platform.

E. Entering an Established Space

Netflix has been a dominant firm in the SVOD service market since their inception. Now that studios are attempting to dethrone them, there are a number of ways in which they can be successful in the space. Suarez and Kirtley (2012) discuss ways in which newcomers can overtake market leaders. A key piece is attracting and retaining users. Suarez and Kirtley propose companies can use subsidies to incentivize users to join. This can get consumers onto their platforms and retain them as customers. Another way of overtaking a market leader is to find a distinctive segment of users which have not necessarily been targeted with the current market leader. Netflix has appealed broadly across consumers, so by specifically targeting your branding, consumers might flock towards services which they are targeted by. Suarez and Kirtley also talk about leveraging your existing platforms to supplement the new product. Studios have an advantage here in the fact that they can leverage their existing content and have an established base of consumers who appreciate their content (Suarez and Kirtley 2012).

I attempt to help fill in an understanding of how the cable industry has reacted to Netflix's disruption. In particular, I am interested in how Netflix's impact has changed over time, and what this can tell us about the coming Streaming Wars.

IV. Hypotheses

I examine the relationship Netflix has had with the cable industry as it has grown and how that relationship has changed over time. By providing an alternative vehicle for consuming media, they might have taken customers from the cable industry (Aliloupour 2016). This brings me to my first hypothesis;

H1: *Netflix's growth has had a significant negative effect on the cable industry's growth.*

In addition to this, I analyze how Netflix's effect on the growth of cable companies has changed over time. Netflix was an early mover and was able to gain their market share quickly and rapidly without much direct competition. Over time though, firms have had time to respond. I anticipate that the correlation between Netflix and the cable industry has weakened over time due to responses and solutions being developed such as integrating OTT services into cable subscriptions. Another potential reason for this is that Netflix was initially poaching subscribers from the cable industry, but eventually carved out a separate market. Given multihoming, customers could be choosing multiple services to use. Thus, in recent years, the gains of one do not necessarily need to reflect the losses of another.

H2: *Netflix's negative effect on cable revenue has diminished over time; Netflix had a more impactful negative effect on the cable industry early on than in more recent years.*

V. Data

I use time series data from Compustat. I pulled the quarterly revenue for Netflix as well as for all "Cable and Other Subscription Programming" companies (North American Industry Classification System (NAICS) code 515210), henceforth referred to as cable companies, for 2001Q1 through 2019Q2. The companies contained in this industry are involved in operating studios and facilities for the broadcasting of their content on a subscription basis (NAICS Association 2019). I examine revenue because it provides the best measure to represent consumer engagement.

The data consists of the company name, time period, and revenue. The time period is the calendar quarter and year in which the revenue was reported. I add the revenue for each of the cable companies by quarter to obtain the total revenue per quarter for the cable industry. I take the log of revenue and take the difference between that and its lag it to help determine how Netflix's growth has impacted the cable industry's growth. For some of my analysis, I also aggregate the revenue by year.

Figure 2 shows Netflix's revenue over time. It increases over time and accelerates in the early 2010s. Figure 3 shows the cable industry's revenue over time. It increases over time as well until the mid-2010s when it starts to be volatile. Figure 4 shows Netflix and the cable industry's ln(Revenue) over time. Netflix is steadily gaining relative to the cable industry. In Figure 5, I show the four quarter difference for the cable industry and Netflix's ln(Revenue). Netflix maintains a positive growth over time except for small dips around 2007 and 2013. In Figure 6, I show the one quarter difference for the cable industry and Netflix's ln(Revenue). Both groups remain around the same value, but the cable industry is far more volatile. Finally, in Figure 7, I show the one year difference for

the cable industry and Netflix's ln(Revenue). Netflix is maintaining higher year over year growth here as well except for a small dip in 2007.

VI. Empirical Method

For all regressions, I use both a standard OLS regression with robust standard errors and an OLS regression with Newey-West standard errors. Newey-West standard errors can be used in cases where autocorrelation and potentially heteroscedasticity are suspected (Stock and Watson 2019). For each regression with robust standard errors, I regress the lagged residuals on the residuals to assess whether there appears to be autocorrelation.

To test H1, I estimate the following model:

$$(1) \qquad dLn\left(Revenue_{Cable_t}\right) = \alpha + \beta_1 dLn\left(Revenue_{Netflix_t}\right) + \beta_2 t + \varepsilon_t$$

where $dLn\left(Revenue_{Cable_t}\right)$ is the change in cable industry's ln(revenue)[4], α is a constant, $dLn\left(Revenue_{Netflix_t}\right)$ is the change in Netflix's ln(revenue), and t is the period for the time series set. If β_1 is negative, then that indicates that Netflix's growth has a negative impact on the cable industry's growth which supports my hypothesis. I estimate equation (1) with and without calendar quarter effects that help account for changes in seasonality. The equation with the calendar quarters is estimated below:

$$(2) \qquad dLn\left(Revenue_{Cable_t}\right) = \alpha + \beta_1 dLn\left(Revenue_{Netflix_t}\right) + \beta_2 t + \beta_3 Q_2 + \beta_4 Q_3 + \beta_5 Q_4 + \varepsilon_t$$

where Q_2, Q_3, Q_4 are dummy variables that take the value 1 if the revenue reported takes place in the relevant quarter.

[4] Calculated by taking the difference between the natural log of revenue in the given time period and the natural log of revenue in a prior period (I use four quarter and one quarter lags and annual growth).

To test H2, I run the following regression, which includes an interaction between the growth of Netflix and time:

$$(3) \qquad dLn\left(Revenue_{Cable_t}\right) = \alpha + \beta_1 dLn\left(Revenue_{Netflix_t}\right) + \beta_2 t + \beta_3[dLn\left(Revenue_{Netflix_t}\right) * t] + \varepsilon_t$$

where I add an interacted term between the change in ln(Revenue) of Netflix and the time period to help determine how that variable changes over time. If β_3 is positive, then it indicates that Netflix's impact on the cable industry's growth has a weaker effect as t increases which supports my second hypothesis.

Next, I run the following regression:

$$(4) \qquad dLn\left(Revenue_{Cable_t}\right) = \alpha + \beta_1 dLn\left(Revenue_{Netflix_t}\right) + \beta_2 t + \beta_3[Late * dLn\left(Revenue_{Netflix_t}\right)] + \beta_4[Late * t] + \varepsilon_t$$

where I include the variable, $Late$, which is a dummy variable that is a 0 if the period was before 2013 and 1 if the period was on or after 2013[5]. $Late$ interacts with the change in ln(revenue) for Netflix and the period to find out if the time being after 2013 has a significant effect. If β_3 is positive, then that indicates that in the late period Netflix's revenue growth has not have a negative impact on the cable industry's revenue which supports my second hypothesis.

Then, I run the first regression again where I restrict the data to before 2013, and on or after 2013 (models 5a and 5b). This allows me to directly test if Netflix's impact on

[5] I choose 2013 since it is the year in which other OTT video services started to emerge.

the cable industry was different before or after 2013. If β_2 is negative in the 5a regression and positive or insignificant in the 5b regression, then it indicates support of my second hypothesis.

To control for potential seasonality effects, I also run the previous regressions using a one quarter growth rather than a four quarter growth. I also run the regressions using aggregated year by year data with a one year growth. These are useful and appropriate because they give a greater context and allow the exploration of different growth areas.

VII. Results

As seen in Table 2, in equation (1) using the four quarter lag, $\beta_1 = -0.160$ and is significant at the 5% level. Using the one quarter lag, $\beta_1 = -0.738$ and is significant at the 10% level. Using annual data, $\beta_1 = -0.188$ which is statistically insignificant. The β_1 in the four quarter lag and one quarter lag support H1: Netflix's revenue growth has a negative impact on the cable industry's revenue growth.

As seen in Table 3, in equation (2), using the four quarter lag, β_3, β_4, and β_5 are statistically insignificant. I remove the quarter dummy variables for all the following regressions in the four quarter lag data set since they do not have a significant effect. Using the one quarter lag, β_3 and β_5 are statistically significant at a 1% level so I include the quarter dummy variables in all the following regressions. I find signs of autocorrelation[6] so I use the β_1 with Newey-West standard errors and find $\beta_1 = -0.350$ which is significant at the 1% level. Using the Newey-West standard errors does not affect our conclusions about H1 since it accounts for the suspected autocorrelation.

Overall, the results are consistent with H1.

In equation (3), using the annual data, four quarter lag, and one quarter lag, the β_3's are not statistically significant. Despite this, as seen in Table 4, they are all positive which indicates that there might be a change towards a positive direction as time increases which supports H2.

In equation (4), using the annual data, $\beta_3 = 1.847$ which is significant at a 10% level. Using the four quarter lag, $\beta_3 = 1.478$ which is significant at a 1% level. Using the

[6] When regressing the lagged residuals on the residuals of the standard regression, I find a coefficient of -0.63 which indicates signs of Autocorrelation.

one quarter lag, β_3 is not statistically significant. This supports H2, since the dummy variable, Late, indicates Netflix's revenue growth has a positive effect in the late time period.

In equation (2) (Tables 6a and 6b) using the four quarter lag, $\beta_1 = -0.198$ which is significant at a 5% level before 2013 and $\beta_1 = 1.255$ which is significant at a 5% level after 2013. This change from a negative relationship to a positive relationship supports H2. Using the one quarter lag, $\beta_1 = -0.586$ which is significant at a 5% level before 2013 and $\beta_1 = 0.133$ which is not statistically significant after 2013. This change from a negative relationship to an insignificant relationship supports H2. Finally, using the annual data, $\beta_1 = -0.221$ which is statistically insignificant before 2013 and $\beta_1 = 2.382$ which is statistically insignificant after 2013.

Overall, the results are consistent with H2.

VIII. Conclusion

I find that that Netflix's revenue growth has had a negative impact on the cable industry's revenue growth, and that Netflix's impact on the cable industry has diminished over time. I interpret that this as a new market forming for OTT video services apart from the traditional cable industry. In addition, several of the top 10 firms by revenue in the cable industry such as Comcast Corporation, The Walt Disney Company, and Viacom Inc have released competition with Netflix (Reiff 2019, Warner Media 2019, James 2019). The release of services like CBS All Access, Hulu, and Amazon Prime Video have given consumers an alternative to Netflix. Rather than competing for cable customers, I interpret that Netflix is now competing with these other services. Consumers are faced with the issue of multihoming and which services they will be subscribing to. The emergence of Disney+, Apple TV+, HBO Max, Peacock, and other services will only give consumers more options. Anderson, Foros, and Kind (2019) propose the variety or specificity of content which each service offers will determine the extent to which consumers will multihome.

Future work in this area could explore other metrics to determine Netflix's impact on the cable industry such as profits or costs. One could also dive into the characteristics of different OTT streaming services to compare and contrast the strengths and weaknesses of each. In addition, one could examine how smaller/niche streaming such as Quibi[7] and Crunchyroll fit into the market. It is also easy to see how consumers might get frustrated with such fractured content options. In March of 2019, 47% of consumers in a

[7] Quibi is a new streaming service which will offer short form media at a Hollywood production level for consumption as a "Quick Bite". It has raised over $1 billion in funding (Adalian 2019).

survey by Deloitte's annual Digital Media Trends survey believe there are too many streaming services (Guerrero 2019). Deloitte Vice Chairman Kevin Westcott believes this consumer frustration will lead to an aggregation effect (Variety 2019).

IX. Appendix

Table 1: OTT Streaming Services

Services	Company	Release Date
Apple TV+	Apple	November 1, 2019
Disney+	The Walt Disney Company	November 12, 2019
HBO Max	Warner Media	May 2020
Peacock	NBCUniversal	April 2020
Quibi	Quibi	April 6, 2020
Netflix	Netflix	2007
Amazon Prime Video	Amazon	2011
Hulu	Hulu	2010
CBS All Access	CBS Interactive	2014

Table 2: Regression of Cable Industry ln(revenue) Growth on Netflix's ln(revenue) Growth

Regression #1	**1 Year Growth (Std)**	1 Year Growth (Newey)	4 Quarter Growth (Std)	**4 Quarter Growth (Newey)**	1 Quarter Growth (Std)	**1 Quarter Growth (Newey)**
dln_Netflix	**-0.188**	-0.188	-0.160**	**-0.160***	-0.738***	**-0.738*****
	(0.127)	(0.114)	(0.0742)	**(0.0961)**	(0.224)	**(0.195)**
Period	**-0.0141*****	-0.0141***	-0.00365***	**-0.00365*****	-0.00164*	**-0.00164*****
	(0.00375)	(0.00374)	(0.000643)	**(0.000939)**	(0.000963)	**(0.000481)**
Constant	**0.260*****	0.260***	0.250***	**0.250*****	0.135***	**0.135*****
	(0.0675)	(0.0720)	(0.0389)	**(0.0578)**	(0.0407)	**(0.0308)**
Observations	**17**	17	70	**70**	73	**73**
R-squared	**0.424**		0.307		0.104	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The regression is run on data sets with one year growth, four quarter growth, as well as one quarter growth. I run an OLS regression with both standard errors and Newey-West standard errors. I test for autocorrelation by regressing the residuals on lagged residuals. If there is autocorrelation, I bold the newey column, and if not then the standard column.

Model:

$$dLn\left(Revenue_{Cable_t}\right) = \alpha + \beta_1 dLn\left(Revenue_{Netflix_t}\right) + \beta_2 t + \varepsilon_t$$

Table 3: Regression of Cable Industry ln(revenue) Growth on Netflix's ln(revenue) Growth with Quarterly Dummy Variables

Regression #2	4 Quarter Growth (Std)	**4 Quarter Growth (Newey)**	1 Quarter Growth (Std)	**1 Quarter Growth (Newey)**
dln_Netflix	-0.160**	**-0.160**	-0.350	**-0.350***
	(0.0755)	**(0.0986)**	(0.227)	**(0.207)**
Period	-0.00365***	**-0.00365*****	-0.00120	**-0.00120****
	(0.000658)	**(0.000963)**	(0.000790)	**(0.000514)**
2.quarter	0.00460	**0.00460**	0.190***	**0.190*****
	(0.0291)	**(0.0184)**	(0.0315)	**(0.0359)**
3.quarter	-0.0144	**-0.0144**	0.0529	**0.0529**
	(0.0319)	**(0.0261)**	(0.0380)	**(0.0377)**
4.quarter	0.000186	**0.000186**	0.198***	**0.198*****
	(0.0315)	**(0.0237)**	(0.0361)	**(0.0422)**
Constant	0.252***	**0.252*****	-0.0230	**-0.0230**
	(0.0427)	**(0.0590)**	(0.0570)	**(0.0500)**
Observations	70	**70**	73	**73**
R-squared	0.311		0.492	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The regression is run on data sets with one year growth, four quarter growth, as well as one quarter growth. I run an OLS regression with both standard errors and Newey-West standard errors. I test for autocorrelation by regressing the residuals on lagged residuals. If there is autocorrelation, I bold the newey column, and if not then the standard column.

Model:

$$dLn\left(Revenue_{Cable_t}\right) = \alpha + \beta_1 dLn\left(Revenue_{Netflix_t}\right) + \beta_2 t + \beta_3 Q_2 + \beta_4 Q_3 + \beta_5 Q_4 + \varepsilon_t$$

Table 4: Regression of Cable Industry ln(revenue) Growth on Netflix's ln(revenue) Growth with Interaction Term

Regression #3	**1 Year Growth (Std)**	1 Year Growth (Newey)	4 Quarter Growth (Std)	**4 Quarter Growth (Newey)**	1 Quarter Growth (Std)	**1 Quarter Growth (Newey)**
dln_Netflix	**-0.214**	-0.214	-0.281*	**-0.281**	-0.523	**-0.523**
	(0.289)	(0.269)	(0.147)	**(0.202)**	(0.371)	**(0.332)**
Period	**-0.0156**	-0.0156	-0.0055***	**-0.0055****	-0.00193	**-0.00193**
	(0.0128)	(0.0133)	(0.00186)	**(0.00255)**	(0.00160)	**(0.00124)**
2.quarter					0.194***	**0.194*****
					(0.0333)	**(0.0372)**
3.quarter					0.0577	**0.0577**
					(0.0402)	**(0.0401)**
4.quarter					0.200***	**0.200*****
					(0.0371)	**(0.0435)**
dln_Netflix * Period	**0.00490**	0.00490	0.00594	**0.00594**	0.00978	**0.00978**
	(0.0361)	(0.0349)	(0.00566)	**(0.00742)**	(0.0166)	**(0.0143)**
Constant	**0.271****	0.271*	0.298***	**0.298*****	-0.00884	**-0.00884**
	(0.125)	(0.132)	(0.0612)	**(0.0906)**	(0.0644)	**(0.0557)**
Observations	**17**	17	70	**70**	73	**73**
R-squared	**0.425**		0.318		0.496	

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The regression is run on data sets with one year growth, four quarter growth, as well as one quarter growth. I run an OLS regression with both standard errors and Newey-West standard errors. I test for autocorrelation by regressing the residuals on lagged residuals. If there is autocorrelation, I bold the newey column, and if not then the standard column.

Model:

$$dLn\left(Revenue_{Cable_t}\right) = \alpha + \beta_1 dLn\left(Revenue_{Netflix_t}\right) + \beta_2 t +$$

$$\beta_3[dLn\left(Revenue_{Netflix_t}\right) * t] + \varepsilon_t$$

Table 5: Regression of Cable Industry ln(revenue) Growth on Netflix's ln(revenue) Growth with Late Period Considerations

Regression #4	**1 Year Growth (Std)**	1 Year Growth (Newey)	**4 Quarter Growth (Std)**	4 Quarter Growth (Newey)	1 Quarter Growth (Std)	**1 Quarter Growth (Newey)**
dln_Netflix	**-0.260***	-0.260**	**-0.216*****	-0.216**	-0.380	**-0.380**
	(0.128)	(0.116)	**(0.0721)**	(0.0814)	(0.270)	**(0.237)**
Period	**-0.0193****	-0.0193***	**-0.00436*****	-0.00436***	-0.00158	**-0.00158***
	(0.00665)	(0.00617)	**(0.00108)**	(0.00122)	(0.00155)	**(0.000884)**
2.quarter					0.187***	**0.187*****
					(0.0337)	**(0.0430)**
3.quarter					0.0498	**0.0498**
					(0.0382)	**(0.0340)**
4.quarter					0.196***	**0.196*****
					(0.0378)	**(0.0491)**
Late * dln_Netflix	**1.847***	1.847*	**1.478*****	1.478**	-0.166	**-0.166**
	(1.034)	(0.862)	**(0.523)**	(0.610)	(1.447)	**(0.794)**
Late * Period	**-0.0268**	-0.0268*	**-0.00550****	-0.00550**	0.000458	**0.000458**
	(0.0164)	(0.0139)	**(0.00218)**	(0.00262)	(0.00173)	**(0.000886)**
Constant	**0.321*****	0.321***	**0.287*****	0.287***	-0.0106	**-0.0106**
	(0.0847)	(0.0855)	**(0.0457)**	(0.0568)	(0.0734)	**(0.0589)**
Observations	**17**	17	**70**	70	73	**73**
R-squared	**0.465**		**0.386**		0.494	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The regression is run on data sets with one year growth, four quarter growth, as well as one quarter growth. I run an OLS regression with both standard errors and Newey-West standard errors. I test for autocorrelation by regressing the residuals on lagged residuals. If there is autocorrelation, I bold the newey column, and if not then the standard column.

Model:

$$dLn\left(Revenue_{Cable_t}\right) = \alpha + \beta_1 dLn\left(Revenue_{Netflix_t}\right) + \beta_2 t +$$

$$\beta_3[Late * dLn\left(Revenue_{Netflix_t}\right)] + \beta_4[Late * t] + \varepsilon_t$$

Table 6a: Regression of Cable Industry ln(revenue) Growth on Netflix's ln(revenue) Growth Where Period is Before 2013

Regression #5a	**1 Year Growth (Std)**	1 Year Growth (Newey)	4 Quarter Growth (Std)	**4 Quarter Growth (Newey)**	1 Quarter Growth (Std)	**1 Quarter Growth (Newey)**
dln_Netflix	**-0.221**	-0.221	-0.198**	**-0.198****	-0.586**	**-0.586****
	(0.132)	(0.124)	(0.0750)	**(0.0851)**	(0.236)	**(0.231)**
Period	**-0.0168****	-0.0168**	-0.00408***	**-0.00408*****	-0.00209	**-0.00209***
	(0.00683)	(0.00654)	(0.00117)	**(0.00139)**	(0.00133)	**(0.00112)**
2.quarter					0.0824**	**0.0824****
					(0.0325)	**(0.0347)**
3.quarter					0.0309	**0.0309**
					(0.0334)	**(0.0347)**
4.quarter					0.0876**	**0.0876****
					(0.0380)	**(0.0421)**
Constant	**0.290****	0.290**	0.273***	**0.273*****	0.0788	**0.0788**
	(0.0913)	(0.0951)	(0.0508)	**(0.0665)**	(0.0666)	**(0.0631)**
Observations	**11**	11	44	**44**	47	**47**
R-squared	**0.177**		0.123		0.394	

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The regression is run on data sets with one year growth, four quarter growth, as well as one quarter growth. I run an OLS regression with both standard errors and Newey-West standard errors. I test for autocorrelation by regressing the residuals on lagged residuals. If there is autocorrelation, I bold the newey column, and if not then the standard column.

Model:

$$dLn\left(Revenue_{Cable_t}\right) = \alpha + \beta_1 dLn\left(Revenue_{Netflix_t}\right) + \beta_2 t + \varepsilon_t$$

Table 6b: Regression of Cable Industry ln(revenue) Growth on Netflix's ln(revenue) Growth Where Period is After 2013

Regression #5b	1 Year Growth (Std)	**1 Year Growth (Newey)**	4 Quarter Growth (Std)	**4 Quarter Growth (Newey)**	**1 Quarter Growth (Std)**	1 Quarter Growth (Newey)
dln_Netflix	2.382**	**2.382*** **	1.255**	**1.255***	**0.133**	0.133
	(0.687)	**(0.315)**	(0.532)	**(0.651)**	**(0.931)**	(0.863)
Period	-0.0717**	**-0.0717*** **	-0.0107***	**-0.0107*** **	**-0.00254**	-0.00254*
	(0.0141)	**(0.00869)**	(0.00314)	**(0.00287)**	**(0.00215)**	(0.00125)
2.quarter					**0.352*** **	0.352***
					(0.0354)	(0.0408)
3.quarter					**0.0514**	0.0514
					(0.0596)	(0.0603)
4.quarter					**0.377*** **	0.377***
					(0.0323)	(0.0365)
Constant	0.524**	**0.524** **	0.340***	**0.340*** **	**-0.0530**	-0.0530
	(0.119)	**(0.0959)**	(0.100)	**(0.0999)**	**(0.137)**	(0.0853)
Observations	6	**6**	26	**26**	**26**	26
R-squared	0.693		0.384		**0.859**	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The regression is run on data sets with one year growth, four quarter growth, as well as one quarter growth. I run an OLS regression with both standard errors and Newey-West standard errors. I test for autocorrelation by regressing the residuals on lagged residuals. If there is autocorrelation, I bold the newey column, and if not then the standard column.

Model:

$$dLn\left(Revenue_{Cable_t}\right) = \alpha + \beta_1 dLn\left(Revenue_{Netflix_t}\right) + \beta_2 t + \varepsilon_t$$

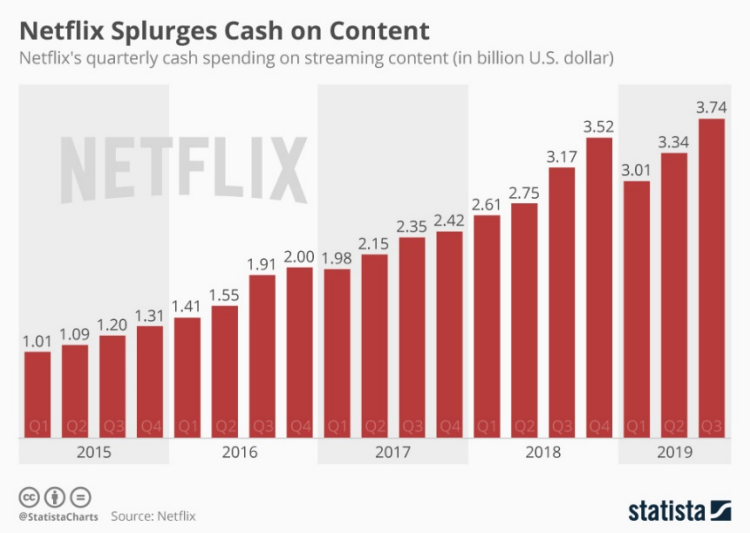

Figure 1 (Richter 2019)

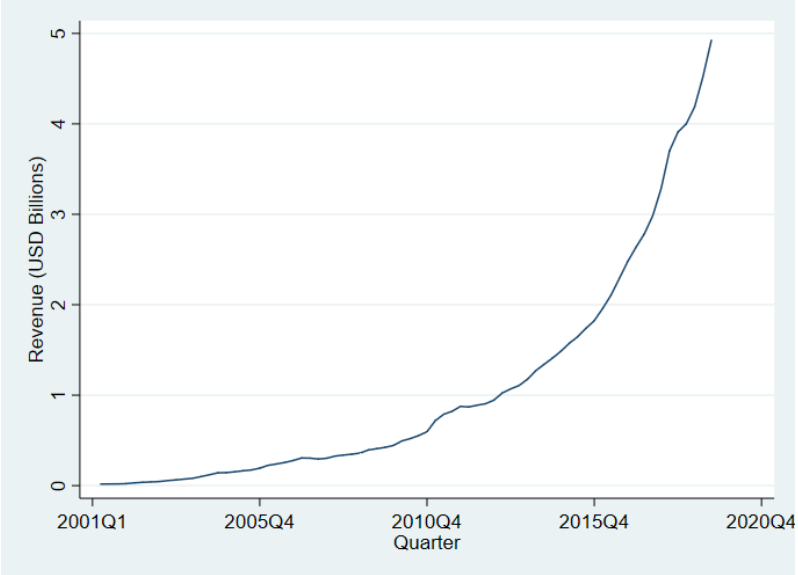

Figure 2: Netflix Revenue (2001Q1-2019Q2)

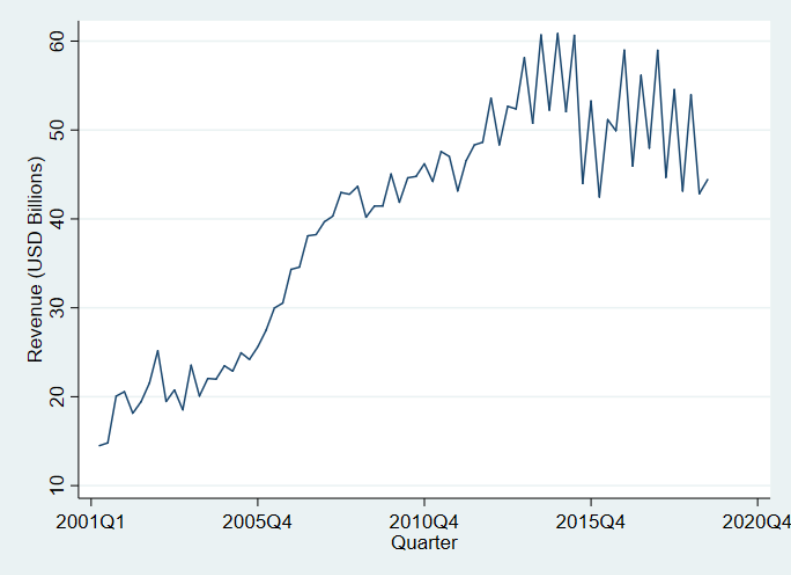

Figure 3: Cable Company Revenue (2001Q1-2019Q2)

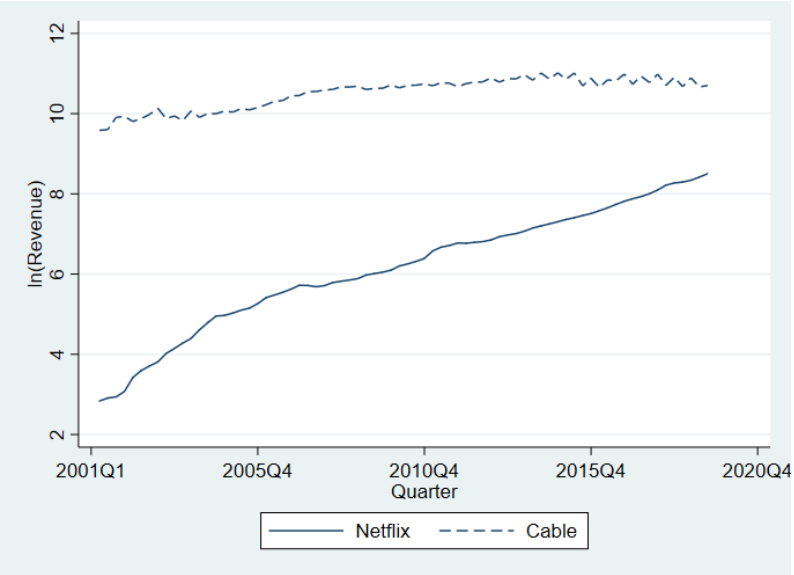

Figure 4: Natural Log of Cable Company Revenue and Netflix Revenue

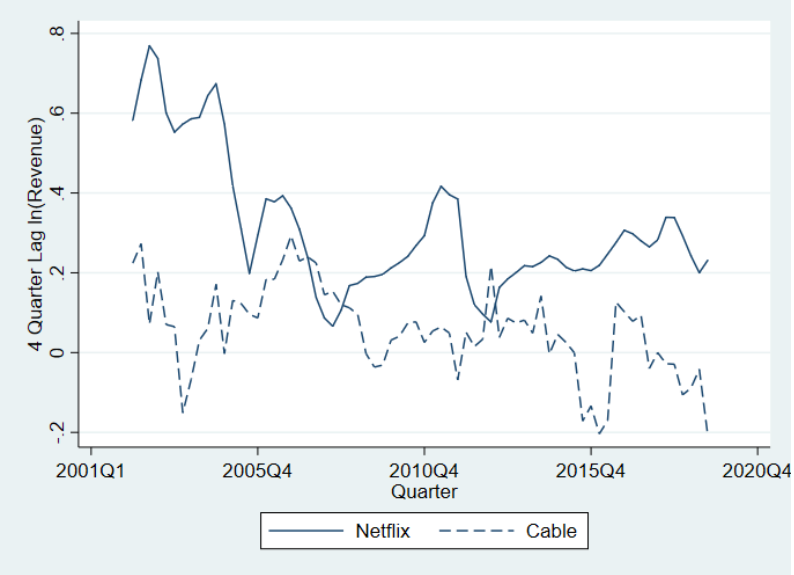

Figure 5: Cable Industry and Netflix's 4 Quarter Difference ln(Revenue)

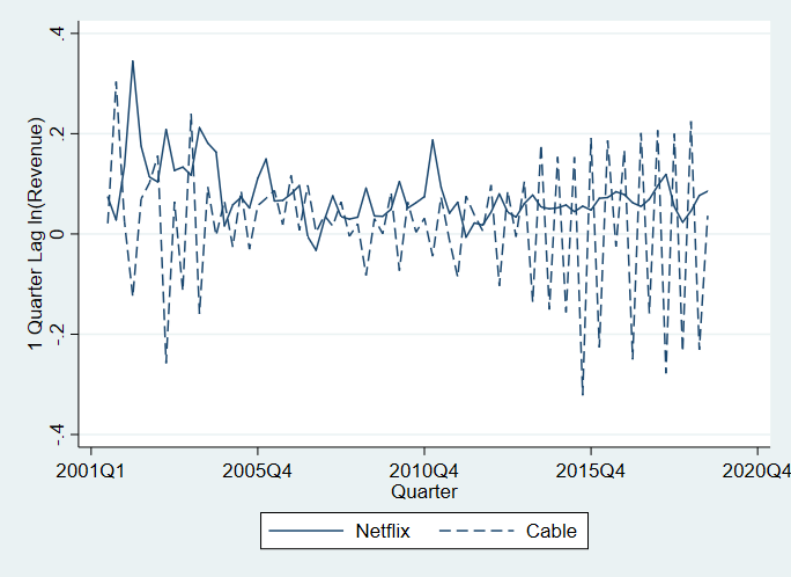

Figure 6: Cable Industry and Netflix's 1 Quarter Difference ln(Revenue)

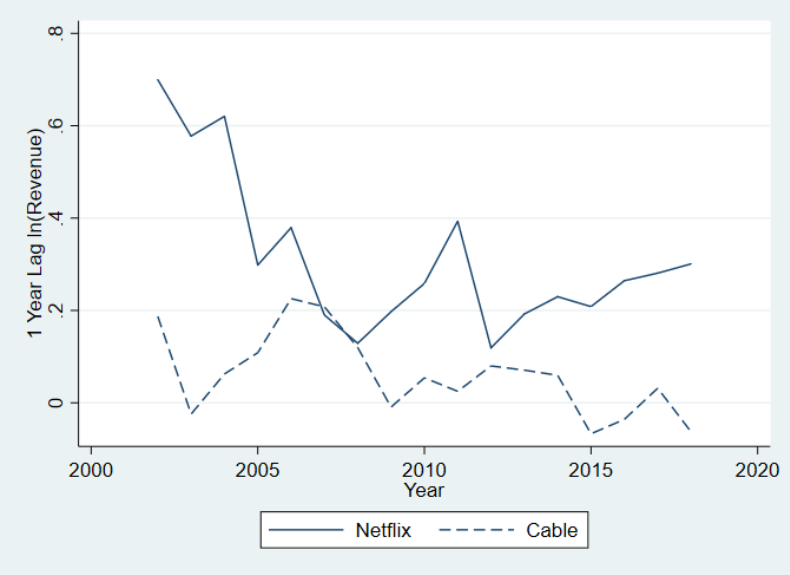

Figure 7: Cable Industry and Netflix's 1 Year Difference ln(Revenue)

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