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Constraining the digital world

Structuring net neutrality regulation through the lens of
Lessig's New Chicago School model

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Abstract

The ability of law to govern the internet continues to be doubted by many activists. Yet there are still calls from many to sanction actors believed to be construing the freedom of the internet. One popular call has been for net neutrality, aiming to stop Internet Service Providers from customizing traffic for different services. But is legal action the only tool we have to regulate a thing?

Lawrence Lessig's New Chicago School model enables us to structure a problem of regulation by identifying four modalities of regulation that act upon an issue. By looking at how law, markets, norms and architecture affect an issue, we can gain more insight into the intricacies of regulation.

In this thesis the author uses the New Chicago School model to analyse and structure the problem of net neutrality regulation. The author constructs an analytical tool that identifies regulations according to agency or self-execution, objectivity or subjectivity, direct or indirect approach, and also how the modalities may counteract each other.

The results show that the model is indeed helpful for structuring problems, and that there are many constraints at play, even though there are problems with proper operationalization of the model.

Key words: New Chicago School, net neutrality, pathetic dot, regulation, policies
Words: 19485

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1 Introduction

Until recently, many saw the internet as unregulable, that the technology could change too rapidly for any legislative body to follow. We are however, moving towards a situation where that is no longer the case, and we see both a need and a possibility of regulating the internet. One person who argued this point early on was Professor Lawrence Lessig. In 1998, he introduced something he called the New Chicago School, that dealt with how code regulates behavior in a very concrete sense, and that law can regulate code, and vice versa. In his theory, he proposed that for all things, there are four forces that regulate its behavior – Law, Markets, Norms and Architecture.

In February 2015 Eric Wheeler, the Chairman of the Federal Communications Committee made an important announcement: After a 3-2 vote in the committee, the FCC could finally announce a proper net neutrality regulation and that “that no one – whether government or corporate – should control free open access to the Internet.” (Chappel 2015)

Net neutrality was conceived by Professor Tim Wu, in a 2003 paper. Since then it has been a topic of intense discussion, an extensive amount of research and more than a few regulations. It starts with a line of reasoning common among techies, that information wants to be free. If information is free, then it also enables good things to happen. But if someone tries to make information less free, by for example striking deals about interconnectivity between content providers and Internet Service Providers, then that it perceived as a threat. So to counter this, there has been a popular movement to implement net neutrality as a law.

In this thesis we will marry these two concepts, the New Chicago School theory, and the topic of net neutrality in order to increase our knowledge of how things regulate, and how a thing like net neutrality is subject to different kinds of regulations at all times. Since our tools for regulating the internet are improving, we must gain more knowledge on how that can come about, and to this Lessig gives us the possibility to structure our problem in a more comprehensible way.

1.1 Purpose and research question

The purpose of this thesis is twofold. One purpose is to gain a deeper understanding of the forces that govern net neutrality and how regulating the internet can be thought of. The other purpose is to see how you can apply the New Chicago School theory on a problem to help structure your thoughts and other available information on the issue. A part of the first purpose is that many would probably say that net neutrality as a concept is clear and the solutions are there to

be implemented, but it is relevant to take a step back and examine the issue again to see whether all possibilities have been taken into account. A part of the second issue is that there is a prevalent idea that the internet naturally is a forum where everything is unrestricted but that, again, is something that must be examined to see if it holds true.

Based on this purpose, the question we will ask in the thesis is:

- How can the issue of net neutrality regulation be understood by using the New Chicago School theory?

1.2 Limitations

As of writing this text, a Google search for "net neutrality" OR "network neutrality" gets somewhere in the vicinity of 9.5 million hits, and if you search for the same words in Google Scholar, where results are limited to academic publications, you still end up with over 12 000 different results. While these search results may overlap somewhat in theme, opinion and conclusions, it shows that net neutrality is a topic that requires certain restrictions in terms of scope, if a thesis is to make any sense at all.

The foremost aim of the thesis is not explaining exactly what net neutrality is, what would be a *correct* approach to regulation on net neutrality, or who is right and who is wrong in the debate. It is neither a thesis of law, nor of engineering and computer science, meaning that the analysis of legislation and technology in this text are vessels to further understand the political science implication of how those areas influence the regulation of the network, and net neutrality.

For each of the constraints there is also a need to define some limitations, and these limitations are somewhat entangled with how the constraints are conceptualized.

Law is the constraint where there is the most need to define what to actually look at. "Law" looks at where the law constraints a thing by sanctioning certain actions regarding that thing. That means that it could be relevant to study the legislation in place in different countries, it means that it could be relevant to look at court cases defining how certain legislation should be interpreted. It means that it could be relevant to look at proposed legislation, both actual thought out suggestions and those that have merely been hypothesized. It simply comes down to making choices on what I can reasonably study with in a master thesis. So, the limitations of the study of law is: I will only look at the *US and Sweden*, because the US is where most discussion on net neutrality takes place, and Sweden acts both as a counterpoint where the internet works somewhat differently and it is a country where I can immediately find appropriate sources that are relevant and readily available. I will describe the current net neutrality situation in the countries, and look at a selection of suggestions for how to change the law using both academic writing and more opinionated sources.

Norms might be the constraint where sources are hardest to come by as they are somewhat abstract in the New Chicago School model. The norms also enforce

sanctions if violated, but not from the state. Instead the community enact them. I will therefore look at how opponents and proponents have acted when there has been development in the area of net neutrality policy.

For markets, Lessig's theory pretty much comes down to a supply and demand reasoning, and how prices are set to affect a thing. For this, I will look at how, mainly corporate, actors with scarce resources have approached net neutrality, and in what way supply and demand work in the area.

Finally, the limitations on the constraint of architecture. Architecture is limited by the scope of what is technologically possible, but also, more acutely, by how the technology looks at this very moment. The architectures relevant in this case are two things: Code limits how we interpret packages of information, and physical cables (or rather the underlying physical infrastructure of the internet) limit how many packages information can be delivered at any given time. I will try to give an idea of how the physical infrastructure limits net neutrality, and how code limits. Due to limited technical ability and prowess, I will not test capabilities on my own but will have to use first or second hand sources. I will not cover things like the different languages of code, nor hypothesize on future technological progress as it is a matter of what is being regulated right now.

1.3 Disposition

The thesis is organized in a manner that will hopefully make sure that all important ideas are explained at the earliest convenience, and that each subsequent part builds on the knowledge acquired in previous chapters. In the introduction, I cover the limitations, purpose, disposition and glossary of the core concepts of the thesis.

In chapter two, we introduce the New Chicago School Theory and the concept of net neutrality that will form the basis for all the following parts. In chapter three we develop the New Chicago School Theory further and present four aspects of the four modalities of constraint that will be used in the analysis.

In chapter four we discuss the methodological choices that goes into using the theory for analysis, and of how the sources have been selected. In this chapter we also discuss the validity and reliability of the thesis itself.

In chapter five, we give more detailed input into what net neutrality is and how it has been regulated and reported on up to this point by the respective regulating authorities in the US and Sweden.

In chapter six, we analyze how each of the constraints have acted on net neutrality and how we can structure their effect.

Finally, in chapter seven, we present the conclusions and suggestions for further research.

2 Conceptual background

Before explaining the methodological choices, and the how to use the theory we must establish what sort of thing net neutrality is, and what Lawrence Lessig's theory the New Chicago School deals with. This is therefore a conceptual background that is used to understand the choices made in both method and theory, but also as a preamble to the analysis. We begin with an introduction to the New Chicago School and the core concepts in the theory, which is later developed in the theory chapter. After that, we look at the issue of net neutrality, explaining the concept and its origin, as well as some related ideas that helps us understand later parts of the thesis.

2.1 Introduction to the New Chicago School

The origin of Lessig's theory comes, according to himself, from a lecture at a conference on "Law of cyberspace" where a prominent speaker, Judge Frank Easterbrook, declared that there is "no more a "law of cyberspace" than there was a 'Law of the Horse'" (Lessig 1998, p. 501) and that legal academics should stop thinking about in what ways the internet differ from other aspects of reality. That the judges and lawyers will sort out how to apply the general law on the cyberspace, as they have for all other parts of legislation. However, Lessig's reasoning stems from a belief that there really is something particular about the law of the cyberspace and that it is worthwhile to think "about how law and cyberspace connect". "[The] point is about the limits on law as a regulator and about the techniques for escaping those limits" (Lessig 1998, p. 502).

When we talk about regulation, we usually refer to the political process of changing conditions in society by means of legislation or less strict forms of rules. Those are the most tangible ways that we understand regulations, we have a track record of the changes made, and we have clear and distinct texts about how they apply and who is mandated to uphold such regulations.

But we are also subject to other regulations, invisible ones, or things you rarely even consider as regulations since they are so ingrained in your daily life. One way to think about these kinds of regulations, or rather, to think about how something is affected by different types of regulations, was presented by Lawrence Lessig in the late 1990's. In the article "The New Chicago School" (1998) he launched the theory, and with the article "The Law of the Horse: What Cyberlaw Might Teach" (1999b) and the book *Code: and Other Laws of Cyberspace* (1999a) he established it in wider circles. The book was later updated

in 2006 in collaboration with readers and experts via a wiki-format to become *Code: version 2.0* which we will come back to.

The theory is, jokingly, named by Lessig as “the New Chicago School” (Lessig 2006, p. 340), but is also referred as the Pathetic Dot theory, after the example by which Lessig introduces the concept. It is the theory that will form the framework of this thesis.

In broad terms Lessig says that a thing, in his given example the thing is a pathetic dot, is regulated by four different constraints: Laws, Markets, Norms and Architecture. These constraints act on the pathetic dot by sanctions, be it legal or social, and by barriers to action, be it price or walls, and act both accumulatively and in divergence. They form the space in which we may determine not only which regulation in law is best suitable or most effective, but even more so how legislation interacts with other forms of regulation. We may also see whether constraints may or may not affect a thing, in ways we do not see at first glance.

The thought where the theory started can be put in the same category as a famous line from Swedish entrepreneur Jan Stenbeck: “Technology beats politics” (Andersson 2000, p.16). Meaning, the politics and legislation is thought to have a limited reach as a regulator for the technological innovations and malleability of coders and entrepreneurs to come up with new work-arounds. However, Lessig says that legislators instead have to figure out what tools to use when they want to regulate a thing. Traditional law, “an order backed by a threat directed at primary behavior” (Lessig 1999b, p. 502), does not cover the capabilities which legislators might need to regulate cyberspace.

In the fourth installment of the theory, Code 2.0, Lessig revises some of the original premises of the theory from 1998: What he rallied against then was a view that the net was impossible to regulate, that it was and always would be free from snooping eyes and control by governments and corporations. That it was a regulatory safe haven. While the opposition to such statements was slightly radical in 1998, by 2006 Lessig says that, in reference to many believing he was mistaken in arguing as such, “I am more confident than I was then, and thus I have chosen to stick with this “fundamental mistake”. Perhaps this is simply to hedge my bets: If I’m right, then I have the reward of understanding. If I’m wrong, then we’ll have an Internet that is closer to the values of its original design.” (Lessig, 2006, p. X).

It is also important to note that the theory does not give us a manual for how to create or even analyze regulations, it does not give us answers, but rather it offers a way to structure a problem. An insight that can be used and applied elsewhere later.

2.1.1 Constraints, or modalities of regulation

The ideas Lessig present in “The New Chicago School” (1998) are not just applicable to cyber law, although most examples are framed in that context. It can be applied to other fields as well, even outside of legislation as such. There are

many things which are regulated by other constraints than legislation, and those where it is uncertain which one is actually the governing constraint.

The constraints are, as mentioned previously: Law, Markets, Norms and Architecture. Lessig calls the constraints “regulators” and they each act as “a distinct modality of regulation” (Lessig 2006, p. 124). Of the four, the law is the most commonly thought of regulator, or modality of regulation. It is also the one most readily available for influencing the other modalities. The different constraints are not working in a vacuum, they are not independent of each other. Instead, they are interacting in a lot of different ways, giving the possibility to regulate directly or indirectly, and to adjust to the circumstances. This will be dealt with further on in the text.

The thing they regulate can vary. It can be a pathetic dot as in the first example given, or they could be regulating behavior of some sort, be it car thefts or file sharing. It can also regulate immaterial things, such as traffic mortality rates. In most cases, there is an ideal behind the regulation, as we usually do not regulate for the sake of regulating. Changing the seatbelt legislation has nothing to do with fashion or wanting to enforce a nuisance, but rather an effort to reduce traffic mortality rates.

In this section we will look at a few different examples on how the different constraints act or could act on different things, to get an introduction. In chapter 3 we will look at how the constraints interact, if they regulate post or ex ante, and how they may interact or counteract. And of course how we will use the theory as an analytical tool.

2.1.2 Law

“Law is a command backed up by the threat of sanction. [...] the picture of law is fairly simple and straight-forward: Don’t do this, or else.” (Lessig 2006, p. 340).

In what way does law regulate things? The theory is pretty straight forward: There is a rule mandated by law, and if the rule is not followed, you will pay the consequences. If you surpass the speed limit, you will get fined or your license may get revoked. If you drive recklessly and hit someone you might have to serve jail time. We have laws against downloading copyrighted material without permission, and we have laws that stipulate that you have to pay certain taxes for some forms of consumption, and other taxes for other things. We have laws that criminalizes fraud, or theft, or use of certain drugs. In all cases, where there is a law, there is usually a sanction that follows that law. In that way, laws regulate things in very tangible ways. (Lessig 2006, p. 124)

2.1.3 Norms

“By social norms, I mean those normative constraints imposed not through the organized or centralized actions of a state, but through the many slight and sometimes forceful sanctions that members of a community impose on each other.” (Lessig 2006, p. 340)

Norms also regulate through sanctions. We try to say thank you after a nice dinner and if you do not you might not get invited back, we speak at a reasonable volume when we meet someone or else they might never talk to you again, we say that newborn babies are cute if the parents are showing us pictures to avoid the angry stares from hurt parents and so on. Prejudice is another regulating norm, making it harder for people with different sounding names to get jobs or more likely that they get randomly searched at an airport security station. While not as severe as regulation by law, norms impact our choices in everyday life and is often engrained in the patterns that we express in our behavior and actions. (Lessig 2006, p. 125)

2.1.4 Markets

“The market constraints through price. A price signals the point at which a resource can be transferred from one person to another.” (Lessig 2006, p. 341)

Markets also act on things. The price of gas affects how many people buy hybrid cars, the price of cornflakes affect how many people are likely to buy Coco Pops, and the price of an apartment will affect where you choose to live. Markets do not sanction behavior, but rather regulates choices directly when that choice is being made. That means that when your desire is to buy, say, a new bike, price will regulate your choice as soon as you see the price tag. It will determine the opportunity cost of your finite resources. To some extent, it is also parasitic on law, meaning that it requires things like property law and other rules of engagement to function (Lessig 1998, p. 663).

2.1.5 Architecture

“[T]he constraint of architecture - the way the world is, or the ways specific aspects of it are. Architects call it the built environment; those who don't give out names just recognize it as the world around them.” (Lessig 2006, p. 341)

Finally, architecture. An example from Lessig will have to highlight how much architecture can regulate without people considering it in the first place: “Robert Moses built bridges on Long Island to block buses, so that African Americans, who depended primarily on public transportation, could not easily get to public beaches” (Lessig 1999, p. 92). A similar example that Lessig talks about is the aftermath of *Shelley v Kraemer* when the practice of putting provisions in sales contracts that the buyer of a house had to be of a certain race was struck down in the US, local communities instead started building small but important divides

between communities. Highways without crossings, railways through cities and “[a] thousand tiny inconveniences of architecture” (Lessig 1999, p. 97) affected integration by use of nothing more than architecture. (Ibid.). Unlike the sanctions of laws and norms, architecture always regulates. A door is locked whether or not you wish to go through it.

We will add more complexity to these concepts in chapter three, but this is what we need to have in mind when learning about net neutrality.

2.2 Introduction to Net Neutrality

What is net neutrality? How long has the debate been going on and what has happened so far? In this section we will introduce the concept of net neutrality and a few related concept.

This section starts off with the origin of the concept and then an introduction to the net neutrality debates with the aim of making the discussion as understandable as possible, since an adequate comprehension of the underlying concept is needed to understand the analysis in later sections. We then continue with a section on technology neutrality to get an idea of how technology and politics can relate, and whether artifacts, such as looms or iPads, can have or require certain political implications or systems.

2.2.1 Net neutrality

There are a number of different definitions of what net neutrality is and what it ought to be. Therefore, this thesis will not try to define net neutrality as such, but rather give an explanation to what kind of questions it deals with and what kind of different perspectives there may be in the discussion on the topic.

First of all, what is the deal with net? What kind of thing is it that we actually think should be neutral? What is implied by “net” is the internet itself? The content, the infrastructure, the routers and switches, the cables and the people on it? It is the cables that transport packages of information and the routers, the servers that store information and switches that redistribute information to where it is going. Because the internet contains so many parts, it further complicates the definition of “net neutrality”. Sometimes you will see “network neutrality” used instead of net neutrality. The concepts are almost always completely interchangeable.

Tim Wu, a professor of law at Columbia University and previously at Virginia Law School, is widely recognized for creating and popularizing the concept of network neutrality in a 2003 paper called “Network Neutrality, Broadband Discrimination” in the *Journal of Telecommunications & High Technology Law*. The article started with what is now an impressive observation and prediction: “Communications regulators over the next decade will spend increasing time on

conflicts between the private interests of broadband providers and the public's interest in a competitive innovation environment centered on the Internet." (Wu 2003, p. 141).

After the introduction of the concept, it has been a topic of widespread debate, in regulatory instances as well as in media and on academic sites. As of the writing of this text, the search term ""net neutrality" OR "network neutrality"" gets 12 000 search results on Google Scholar, and 9.5 million search results on Google. It is far too many results to even glimpse all perspectives on the debate, but I can at least introduce some of the main points that have been made.

2.2.2 A brief introduction to how the internet works

In the very basic description of the internet, one can say that it is a series of tubes that connect and distribute information between computers and servers. With that very simple arrangement, you can communicate with contacts on the other side of the globe, you can watch the latest cat video and you can keep constant track on what is going on in the world. You can also develop new ways to decode the information sent, develop new forms of content and services that are accessible through the internet. You can gain access to information that was intended to be inaccessible through various methods, and distribute malevolent and nefarious pieces of information that destroy, hinder or corrupt information in other places.

Depending on who you ask about what the internet is, you might get very different answers. Staffan Jonson, policy advisor at the Internet Foundation in Sweden, writes that if you ask an engineer, you might get the answer that the internet is made up of seven layers of electronic communications according to the OSI model, the Open Systems Interconnection Model which we will look at briefly later. A politician would say that it is an innovation and an opportunity for economic growth in a society, or something that can make health care more efficient or something different to the same effect. An entrepreneur would say the internet creates an arena for new services to be developed (Jonson 2010, p. 13).

The examples highlight that there are deep technological perspectives of the internet, political ones, and business perspectives as well. In the end, all these perspectives are a product of the ability of computers, connected in a vast network of cables and tubes, to send, interpret and display information that has traveled in the form of 1's and 0's.

2.2.3 Net neutrality issues

Wu wrote this original article to broaden and update a discussion on "open access", which was the previous iteration of net neutrality, where it was suggested that broadband operators ought not to deliver services on the internet, so as to split delivery of internet access from delivery of services on the internet. Wu suggested

ways in which one could try to regulate internet operators to handle the “likely recurrence of these kinds of questions” (Wu 2003, p. 142).

The proponents of net neutrality have been calling on the regulation of internet operators in order to, at least in general terms, keep the internet open, claiming that an internet without net neutrality would lead to those who have resources buying prime access to an internet fast lane, leaving normal consumers in a slow lane. Another version of the same story is that an internet without net neutrality would lead to a “cable-TV-internet” where consumers will have to go through the internet operators, who could act as gatekeepers, to access desirable and high quality content.

The opponents of net neutrality, we will get back to who those are in chapter 6, generally argue that if net neutrality was to be instituted, it would mean that internet operators cannot develop better products that would help consumers to a greater extent than today. They say that a non-neutral net would increase the innovations on internet traffic to create a more versatile online experience. While both of these perspectives hold some legitimacy, they are also flawed in a number of ways, and we will cover more of that in the analysis.

% change in Netflix download speed since Jan. 2013, by I.S.P.

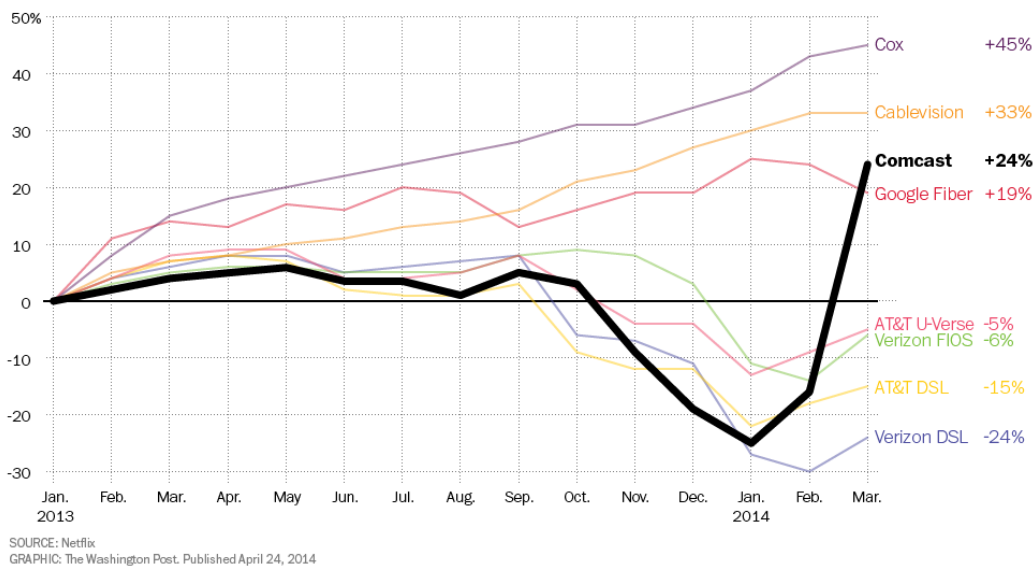


Image 1: Ehrenfreund 2014.

There has also been a number of examples of where operators have, at least according to some, abused their position and furthered calls for instituting net neutrality. The one above, popularized by John Oliver on the show Last Week Tonight, is a graph showing the capacity increase on Netflix services from different US internet operators. It shows a segment of time during which Netflix was negotiating with Comcast, one of the major internet operators in the US, about an interconnectivity deal (where content providers pay broadband providers to get an improved delivery by integrating their delivery with the providers networks). The graph shows that during the time that the negotiations are said to have been going on, the delivery speed for Netflix showed a drastic drop, specifically on Comcast. When the deal was struck, the speed again shot up. It could be hypothesized that Comcast abused their position in order to force Netflix

into a deal, and this was also the story that the Washington Post covered. (Gustin 2014)

An updated graph taken from Netflix own reporting on ISP speed shows that in August of 2014, more interconnectivity deals were struck, leading to a further increase in speeds, after a time of decrease.

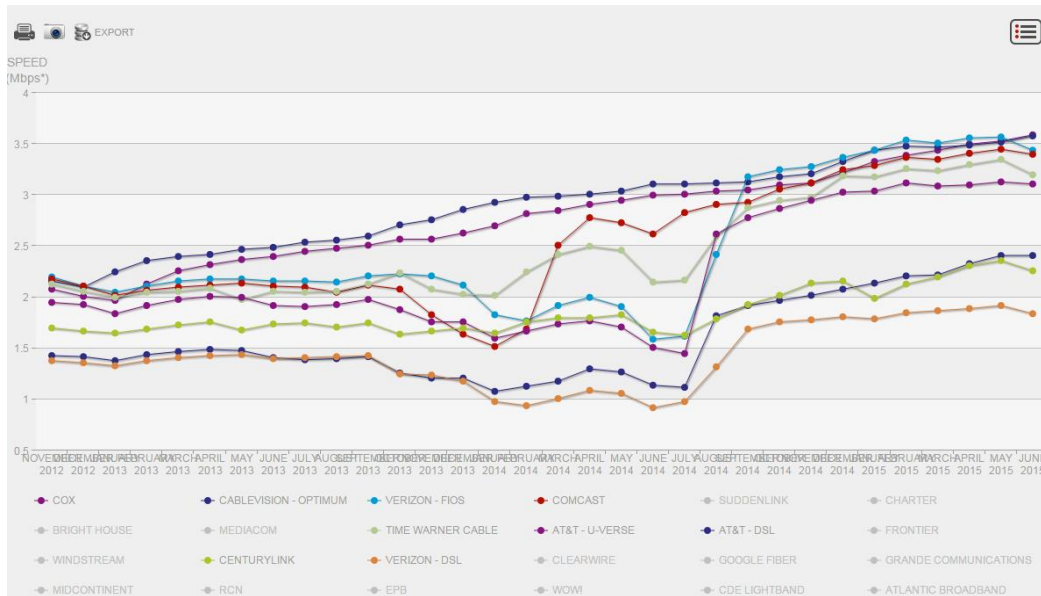


Image 2: Netflix 1.

Another example of a possible abuse of the principles of net neutrality is when Swedish ISP Telia blocked access to Skype in 2012, as they considered Skype to be a competitor to their telephone services, while operating on the internet spectrum instead. They said in their annual report that:

“Changed customer behavior which leads to a mix shift in our business highlights the need to develop our business models and how we charge for our services going forward. We have been in the forefront stating that while prices for voice will continue to come down there must be a stronger correlation between usage and pricing of data.” (TeliaSonera 2012)

While the reasoning may be understandable from a pure business perspective, and it created an uproar in both media and from the public. Telia has since withdrawn from this policy, after only a few months, stating among other things that it turned out to be too complicated. (Zirn 2012)

They did, however, also increased their costs for mobile broadband when they stepped away from the VoIP-policy, in line with the quote above. (Fingas 2012)

After this brief introduction to the debate, we will look at how the New Chicago School Theory may be used, and what the methodological choices and problems are with the thesis.

3 Theory

In the previous chapter we learned that there are four different constraints within the New Chicago School, a bit about their origin and looked at examples on how they regulate. In this section we will develop the theory and describe a theoretical tool that can be used for the analysis of net neutrality later. As mentioned previously, it is important to note that Lessig's theory is not constructed as a way to find definitive answers about how to regulate, or even how regulation happened in the first place, but rather a way to organize a problem into its constituent parts. It can help you structure your thoughts about an issue, which may help you solve it, but is not the solution itself.

We will look at four different aspects of constraints and regulation. The first two helps us specify how a regulation works. The agency regulation helps us by looking at how a constraint is executed. Objective versus subjective regulation helps us by looking at how a regulation works for the person taking an action, for someone observing the action and how it regulates in time. The next aspect looks at what type of regulation we should choose in a given situation and whether we want to regulate directly or indirectly. And fourthly we will look at how constraints may counteract each other, creating negative spirals of regulation rather than positive ones.

Finally, we will summarize how these aspects can form an analytical tool that can be used when looking at net neutrality.

3.1 Regulatory agency

The first categorization of the theory is how the regulations are executed. In the background we mentioned that law and norms sanction certain behavior after a violation of a rule, be it legal or social, has occurred. Law sanctions through the power of the state, with legislations that governing bodies have implemented on the society. That legislation is in some form the norms that we, through our elected representatives, want to enforce on society (Lessig 2006 p 340). Therefore, law does not constrain in the same way in all countries, we have different laws. Norms are enforced by the sanctions of the community when an action oversteps what is considered "socially salient behavior" (Ibid). Law and Norm therefor regulate in very similar ways, and the only difference is who enforces the sanctions on the person, the state or the community.

Markets, however, regulate somewhat differently. As previously mentioned, markets regulate through the price mechanism. Prices are a transaction cost, how

much will I have to give you to get the thing I want. They are also an opportunity cost, meaning that with finite resources every choice you make, you will not make another choice, and prices regulate which alternative is most attractive. The point is that prices do not regulate after the transaction takes place, or even after the choice is made. Price regulates at the exact same time that you make a choice. (Lessig 2006 p 341)

These three regulation are in some way built on whether or not an action takes place, if there is some form of agency. If there is no desire or will, no regulation takes place. That is not the case for architecture.

Architecture, or nature, regulates irrespective of the choices or will of the regulated behavior. We cannot travel faster than the speed of light. Unless you have to power to change the architecture, your actions are always constrained by the built world around you. It does not have to stand in your way, it is just there. Lessig calls this the “self-execution” (Lessig 2006 p 342) of architecture, and it is part of what makes it a fundamentally different thing in regulation, and why it is interesting to look at the Law of the Horse. He says that if we are aware of this distinction, we might not need to always rely on “continued agency, loyalty, or reliability of individuals” (Ibid) but can instead construct systems where resistance, slowness, partition of power or whatever else, is built into the system. This goes for political as well as mechanical or digital systems. (Lessig 2006 p 341f)

3.2 Regulating objectively or subjectively

Another distinction made within the theory is whether a regulation acts objectively or subjectively. The distinction between “someone observing when a constraint is imposed [...] and the person who experiences the constraint” (Lessig 2006 p 343). The previous definitions have mostly been about whether a regulation constrains objectively.

In the case of the execution of sanctions, law and norms are objectively an *ex post* regulation, meaning they regulate after the fact. Markets and architecture are objectively *ex ante* regulations, they regulate before an action is made. But if you add a subjective perspective on regulation, a lot of the differences between the regulations disappear.

While law is most often an *ex post* regulation, we are also aware of what the law actually says, and therefore we do not test the limits of the law at every opportunity. We do not hit random passersby in the face, because it goes against both our norms and our laws, and we do this without testing the limit every time. In the same way, after having been burned by nettles or poison ivy as kids, we usually try to avoid them, creating a subjective constraint based on a real life architectural constraint. (Lessig 2006 p 343)

Constraints, therefore, work both subjectively and objectively. While the objective constraint is easy to describe and take into consideration, it might not be as easy to predict if a regulation will have a subjective response as well. Choosing

what regulation to use is just as important as knowing how a specific regulation works, and this is the topic of the next subsection.

3.3 Regulating directly and indirectly

Lessig introduces this level of the theory with an example: Imagine being a society that has a problem with theft of car stereos. “[Not] big in the scale of things, but a frequent and costly enough problem to make more regulation necessary” (Lessig 2006 p 125). If you want to quell this surge of thefts, you can choose law as the constraint. Stealing is already illegal, but obviously that is not enough of a threshold to avoid the risk of getting caught. So one thing you can do is to increase the risk threshold by drastically raising the punishment for theft of car stereos to life in prison. (Lessig 2006 p 125f)

Another way to go about it is changing the architecture of the car radio so that it becomes impossible to play in any other car than the one it was stolen from (by means of codes that in one way or another ties the radio to a specific car), making the value of a second hand car stereo plummet. Both alternatives will have the same outcome on the dot (theft of car radios), but social norms will make the legal option less desirable as most societies would frown on a lifetime in prison for an offence as small as stealing a car radio. We therefore have a situation where the constraints make some options plausible (architecture) and others implausible (law) even if their predicted outcome would have been pretty much the same, at least from the perspective of the pathetic dot. This dynamic interaction “[requires] consideration of not only... legal adjustments, but also predicting the responsive effects such changes will stimulate” (Polk Wagner in Lessig 2006 p 130).

There is also the situation where you choose to use one constraint to indirectly change the dot by directly changing one of the other constraints. A concrete example of this is regulation on seatbelts where car manufacturers had to start adding seat belts to all cars to decrease the danger of automotive transportation and car crashes. The thing we wish to regulate was the loss of lives in traffic related incidents, and we did it by legally mandating architecture to adapt.

These ways of using the constraints are called direct and indirect regulation. In what way do we best serve the goal we want to achieve? Is it through directly forbidding something, or is it by regulating certain architectural features that in itself regulate a certain behavior? Can we hope for norms to change on their own, like with gender equality questions, or should law regulate certain power structures so that the norms are also forced to change? Can free markets help you charge your phone all over the globe, or can you use architectural nudges to prevent technological integration (different power sockets on computers and phones) or ease of use (regulation to make phone manufacturers use the same receptacles for charging)?

Law is probably the constraint that is easiest to see how it can affect other constraints as it is also the constraint normally associated with political regulation. Indeed, Lessig uses the indirect regulation of law as the standard for indirect

regulation, saying: “The law chooses between direct and indirect regulation” (Lessig 2006, 129). We can use laws to change how architecture regulates traffic safety by implementing a law that makes car manufacturer's install seat belts, or that the crumple zones must absorb a certain amount of energy from an impact. We can use laws to change how norms regulate traffic safety by introducing obligatory traffic safety classes in the school curricula. We can use laws to change how markets regulate the availability of more environmentally friendly cars, like with the electric car subsidies in Norway that has made Norway the second biggest market for a company like Tesla. (Reuters 2015)

As a thought experiment, it is possible to see how the other constraints may be used to indirectly affect each other. The internet is one of the places where architecture has an impact on what can and is being regulated. Of course legislators could decide to completely ignore the code of the internet, just as well as they can ignore the way buildings are being built to implement new rules, but usually, they will have to limit their available political solutions to what form the legal area has. Social norms can be used to gradually change the interpretation of the law, especially in political systems where the courts have more power. One such example is the recent advances for marriage equality in the United States where the law has not undergone a huge change, but social pressure has made certain interpretations less frequent, eventually toppling the highest legal authority. And Markets, although it is very difficult to pinpoint a certain internal logic and consciousness of “markets”, make architectures of certain political systems impossible. For example, history has shown that trying to centrally plan production is nearly impossible as market functions such as demand for certain goods work against central planning, the market disrupts the implementation of certain architectures.

These later examples are not fool proof, and are to be considered food for thought for the upcoming chapters. When we discuss indirect regulation, it will be mostly from the perspective of what the law should regulate. In the next section we will look at when the constraints counteract each other and may create negative feedback loops. One of the inherent problems with indirect regulation is that it may be hard to see what effect an indirect regulation might have, especially with strong constraints already working on an issue. (Lessig 2006 p 132ff)

3.4 Regulations contradicting each other

It is not only positive reinforcement of other constraints that is the limit to the interaction between constraints. They also clash, or at least work in opposition to each other, creating either a contradictory situation or even negative feedback loops where one regulation acts negatively on another, and that in turn enforces the first regulation. This is not something that Lessig explicitly mentions in his works on the matter, but it is a logical consequence of his theories and how they apply to the real world.

Even if the law prohibits file sharing of copyrighted material without permission, a majority of the younger generations not only file share, they perceive file sharing as just. The norm for file sharing copyrighted material goes directly against the law's intent to quell precisely that kind of behavior (Svensson & Larsson 2009, p 59). One of the enablers of this contradiction is the architecture of the internet, which does not care about what information you send, thereby allowing criminal activities as well as legal ones.

Markets may also contradict the law. Take the example of drug use, which is generally prohibited in a majority of the countries in the world, yet for example in the United States, before marijuana was decriminalized in certain states 38% indicated that they had tried the then illegal substance (Saad 2013). Despite the intent of the law and, to a certain extent, the norms, markets still make marijuana and other illegal drugs available to consumers.

Another negative feedback loop is mentioned in the books, namely the case of *Shelley v Kraemer* that was mentioned previously. The case involved a practice where deeds on property could be written to exclude people of certain races from purchasing the property. This was a practice of segregation and a racist norm. Before this practice was banned, about "25 percent of properties in South Chicago had been prohibited from sale to African Americans" (Lessig 2009, p. 134). However, just because the law had changed, norms did not. So communities began, according to Lessig, segregating by other means. And one regulation they chose was architecture. By use of highways without easy crossing, railroad tracks and other inconveniences, architecture was used to make it harder for communities to intermingle. (Lessig 2006, p. 134f)

That is where Lessig's example stops, as a case for how indirect regulation may fail. However, I see it as an example where constraints create negative feedback loops. Because the communities now separated will continue to separate even more, and the structural racism existing in the norms of society will become further entrenched, creating even larger differences between the groups on a number of different factors.

At least for certain parties, the clash in the net neutrality framework is between an architecture that has one specific purpose, that promotes one type of behavior, and a market that wants to change the architecture to fit another purpose. It is therefore important to consider such clashes when describing the theoretical framework.

3.5 How to use the New Chicago School as a theoretic framework?

"We are entering a time when our power to muck about with the structures that regulate is at an all-time high. It is imperative, then, that we understand just what to do with this power. And, more importantly, what not to do with it." (Lessig 2006, p. 345)

Previously, I said that the New Chicago School offers a way to structure problems of regulation in a way that makes it possible to use that structure in other circumstances. It is not a way to get full answers and final solutions, but then again, how often do you really get those anyway? In the sections above we have looked at a few different ways to look at problems of regulation, and how to classify different actions and regulations. In this part, we will outline how this may be used in the analysis of net neutrality in later sections.

So far we have established that there are four distinct modalities of regulation: Law, Norms, Markets and Architecture. Laws regulate through sanctions enforced by the government. Norms regulate through sanctions enforced by the community. Markets regulate through price. Architecture regulates through barriers in the real and constructed world.

We have established that these modalities of regulation are executed differently, where some constraints regulate only when an action is taken, while others regulate all the time, irrespective of agency. We have established that the modalities of regulation have different temporal perspectives, where they can be categorized on whether they regulate before or after the fact, or if they regulate subjectively or objectively.

We have also established that regulations can be made direct, or indirect and that it is important to consider what form of regulation to use to get a desired effect. Finally, we have established that regulations may counteract each other and create negative feedback loops.

With these forms of categories and perspectives we can organize and structure the problem of net neutrality regulation in order to gain knowledge of what factors may affect it, and thereby gaining more knowledge on what it really is.

4 Methods

In this section I will develop and describe the methodological choices of this thesis. It begins with a classification of what type of study it is in relation to the research question, and then I will move on to consider the difficulties that has to be taken into consideration before and during the work. According to Essiasson et al. (2009) a large part of the design process is picking the cases to study (Essiasson et al. 2009, p. 99). In this thesis the cases studied are aspects of net neutrality as they relate to the New Chicago School theory.

Other basic choices that have been made is narrowing down the cases to USA and Sweden. This choice is made because of their respective peculiarities in the question. USA because it has been the center for most of the debate, and a few different variations on regulation. And Sweden because it was a nation that quickly built up their IT-infrastructure with a lot of state incentives, making the market look very different from the US. And these countries are also relevant because I am able to read sources from both without any third party translations.

4.1 How the theory is used

The main idea of the thesis is to analyze how the New Chicago School Theory can be applied to the issue of net neutrality. According to Essiasson et al. there are three main ways of making an investigation, from the perspective of the empirical material. These are theory testing, theory consuming and theory developing studies (Essiasson et al. 2009, p. 99). In a way, I have done a version of each of the types. Testing and consuming are classified as research where there is an established theory, but where testing has the theory in the center and consuming has empirical evidence at the center. Theory developing research does not have a theory in place before the evidence is collected. In this case, Lessig has created a theory, and we are using that theory to understand the net neutrality issue. But we also have an explicit goal of understanding net neutrality better. And finally, since Lessig has not designed an analytical tool, that part of the theory has to be developed.

4.2 Qualitative and clarifying Study

As for the analysis itself, it is almost purely a qualitative textual analysis. This is first and foremost a consequence the theory the thesis aims to look at. The New Chicago School theory tried to find the specific instances where a thing is regulated by one of the four constraints. Neither of these constraints have a quantitative perspective in Lessig's writing, and while it would not be possible, it would be a stretch to fit them into a quantitative framework.

The qualitative study means that I will look at selection of sources that will serve as representatives of the ideas presented there, and as such will give us an insight into how the constraints have acted on net neutrality. (Esiasson et al. 2009, p. 238)

When the sources have been identified, we must also do an analysis. Since we are interested in finding representative sources that help us decide how different constraints act on a certain debate, we will have to identify two things from our sources. The first is what relation it has to net neutrality. This can be tricky as something may regulate net neutrality without anyone actually mentioning the words net neutrality when talking about it. We therefore need to have a clear idea of what net neutrality actually is, and from there derive what might be relevant to study in each category.

When that understanding is established, we can also make more informed choices of what sources and perspectives may be relevant to study further.

4.3 Validity and reliability

There are two big problems with dealing with the validity and reliability of this study and the analysis of such a vast debate. The first problem arises from the lack of previous research on this particular field of study. And the second problem arises from the vast amount of documents available for the qualitative study. Both these points relate to point one and three of in the definition of what constitutes the validity: Correspondence between theoretical definitions and operational indicators, and that we measure what we say that we measure (Esiasson et al. 2009, p. 64). These are also cases of validity of concept, and validity of results.

There is a lot of research on net neutrality, and there is some research that has used Lessig's New Chicago School theory, but very little research that exists in the cross section of these two groups. Therefore, there are no established categories of analysis that can help determine what to look for, since Lessig's theory is builds on some thematic examples, like smoking, to establish the connections between the modalities and then about random examples to strengthen the argumentation. In the first iteration of the theory, from 1998, Lessig says that the outline of the theory is "of necessity a sketch, and its main objective is simply to mark place where methodological work still needs to be done" (Lessig 1998 p 661). This does not change much in later iterations.

As for the analysis of each of the constraints (Law, Market, Norms and Architecture), there are further problems. After having determined what to look for in each category, there is an enormous amount of sources to look for. Law is probably the area with the most amount of research, as the academic debates in the US on the issue tend to be within the frame of legal regulation, together with some analysis of economic effects. With architecture, the subject of study is so intimately intertwined with net neutrality that it might be hard to pinpoint where regulation actually happens. With Markets, Lessig says that the only type of regulation is price. However, markets are usually more complex than price, and price itself does not need to be a result of a simple demand and supply equation, but instead has much more underlying information than at first glance. And finally, for norms, it is hard to determine what norms exist within a population and how these norms then act to sanction the thing at hand. For Lessig, these modalities of regulation are explained with examples that can be fairly easily identified, but when applying it to a specific subject that is not explicitly studied by Lessig, it becomes harder to find sources and adequate information.

4.4 Sources

As previously mentioned, there is an abundance of resources to look at the question on net neutrality in particular. And therefore, there is an abundance of sources that is theoretically plausible to consider in the analysis and background, so some selection is in order.

Based on the theory, we can conclude that the sources that we need to study can come from a few different types of material. The chosen sources are representative in respect to the theories presented in the previous chapter and based on that limitation, certain selections are natural and strategic to make. They are also chosen because they represent recent developments in the field. (Essiasson et al. 2009, p. 180)

For law, the main source of materials is from different government organizations, mainly the PTS and the FCC. This is because these are the main regulating bodies on the issue of net neutrality in their respective domains. Another source that could have been plausible to use would be academic literature from legal scholars, however, since I am not a lawyer and this is a thesis in political science, and because of the frequency of opinionated input in the field, the government agencies are a more relevant and concrete source to study.

For norms, I have based my research on stories from news. Since sanctions by norms are enforced by the community, and most members of a community would be able to readily identify what norms they act on and how, I will have to interpret what norms have been at play in noteworthy instances of news. There is also very little academic research on the normative aspects of net neutrality.

For markets, I have based my research partly on stories from news, but also from statements from the companies themselves to be able to get an idea of their own motivation for taking certain actions. One possible source for seeing the price

mechanism at work would be to try to find historical prices for data traffic and other related indicators and then correlate them to quality of service. But since those datasets are both hard to come by, and require an effort unreasonable for a master thesis, that is not a viable option.

For architecture I have based my research on academic books describing the internet in different ways. As I am not a programmer or engineer myself, I will have to derive information from their expertise instead.

5 Depictions of Net Neutrality

In this section, we will go through some of the sources and documents that will form the basis for our analysis. These consist of statements, reports and regulations from the regulators in Sweden and the US, as well as academic and other contributions to the public debate on net neutrality. They give an insight into how regulators and others perceive the issues, and are a good source for how the current systems are actually constructed. As such, they are key to being able to analyze the constraints later.

We have two comprehensive text from the Swedish regulator Post- och Telestyrelsen, or the Swedish Post and Telecom Authority, which is the regulator on all things relating to internet and telecommunications infrastructure in Sweden. The first is a short report on net neutrality from 2009, the second is a larger report called the Openness Report, also from 2009, which gives a comprehensive analysis on how the entire value chain of the internet works in Sweden.

After the PTS perspective, we will look at how the FCC, the Federal Communications Committee, have defined net neutrality in the past (2005 and 2010) as well as looking at the 2015 regulation. Why does a master thesis from Sweden look at the American regulations? Mainly because the United States is where a lot of the discussion on net neutrality takes place, and what happens to the internet in the US has, at least until recently, had a lot of impact to the internet in the rest of the world.

5.1 Perspectives from PTS

PTS, Post- och Telestyrelsen, is the regulator of internet governance in Sweden. In that role they have produced a number of different reports that analyze the net neutrality and internet governance situations in Sweden.

5.1.1 The net neutrality report

In a 2009 report called *Nätneutralitet* (eng. Net Neutrality) PTS try to define the concept in a way. They do acknowledge that there is no legal or common definition of net neutrality. A reason for this, according to PTS, is that there are several different interest groups that use the concept in different ways (PTS-ER-2009:6). They do try to form a definition for two different categories, namely users and internet service providers.

“Users should, within the framework of a certain internet access service, be able to:

- Freely receive and send content,
- Freely use content services and software that does not hurt the network.
- Internet service providers should, within the framework of the same internet access service,:
- Not manipulate or deprioritize data traffic for a user based on content, source or destination.
- Give clear information in marketing and terms of conditions regarding the capacity and quality of the connection. “ (PTS-ER-2009:6, p. 9, my translation)

What we get here is two slightly different approaches to net neutrality from the get go. Firstly, within the net neutrality concept, users should *receive* a certain service and that service should not be hindered by anything except for harmful use. Secondly, within the net neutrality concept, Internet service providers need to *provide* a certain service and that service has to be unmanipulated. The internet service provider also needs to give clear information regarding the service. So the two distinct parts of this definition of net neutrality is the receiver and the provider of information services. The burden in the scenario is on the service providers that would have fewer ways to compete in a PTS defined net neutral market.

PTS also try to define what net neutrality is not, since it might help clarifying what they mean in the definition above. They have three main concepts:

- a. It is not “open net”, meaning it does not apply to the situation where a single neutral actor supplies the infrastructure and the end users choose network operators that compete with supplying internet access and other services. This is a common system in Sweden where either municipalities or corporations own the wires and ISPs compete on an equal basis for the users.
- b. It is not about a right to internet access of a certain capacity. This is regulated in article 4 in the European Directive on services in the internal market (also known as the Universal Service Directive). The article regulates what kind of services, and what level of those services should be accessible at a “fixed access point”, i.e. at least a telephone line (Article 4, Directive 2002/22/EC).
- c. Finally, it is not about a situation where a content owner gives exclusive rights of distribution to a certain network operator and network. (PTS-ER-2009:6, p. 8)

In their 2009 publication, PTS also tries to establish whether the net is neutral today, or rather in 2009. Their conclusion is that there is a tiered network in some

ways. Different options in speed means that people who pay more get access to an internet with a larger band width. The capacity range that different operators have also mean that in areas with few competitors, the capacity might get limited solely on the basis of few options. Apart from this there is also a level of traffic discrimination from some operators to enable heavier applications to run smoothly. They note that prioritization of traffic is an effective tool if there is sufficient competition among operators so that end users can choose other operators if one makes prioritizations that end users do not agree with. Relating to their definition of what net neutrality is for service providers (and operators) this later scenario requires full information about what is being prioritized and at what cost. (PTS-ER-2009:6, p. 8)

As for the current legal situation, PTS cites a number of different laws and in Sweden that currently govern what could be described as net neutrality. Most notably, the Electronics Communications Act (Lag (2003:389) om elektronisk kommunikation) that, among other things, regulate quality of service, what kind of information service providers are required to give, and how data packages under transportation are allowed to be treated. Up until 2009, PTS had had reason to reason to act in a question relating to net neutrality according to their definition of the concept. (PTS-ER-2009:6, pp. 10-11).

PTS notes that a lot of the perspectives in the Swedish and European net neutrality debate are inherited from the American debate on the same issues. According to PTS, the main problem in the United States stem from a duopoly (where two corporations hold large parts of the market) situation in the access network, i.e. the local networks between your outlet and the station that connects all your local wires (PTS-ER-2009:6). We will touch upon this issue later, but as a short briefing, this means that there is a worry that these two corporations might discriminate traffic that provides competition to the corporation's' own services. Since there are no access regulations as in Europe, meaning no rules that say all service providers can compete at an equal basis on the infrastructure, there might be no option to choose a competitor in some American markets. (PTS-ER-2009:6, p. 8)

5.1.2 The Openness Report

In late 2009, PTS developed parts of the Net Neutrality Report into the Openness Report for the Swedish Government. In the preamble, PTS describe the report as an investigation on “openness on the market for electronic communications”. The initial request from the government was made on the 4th of June in 2009, and PTS were asked to investigate and analyze the following:

- What openness means for the infrastructure and transmission levels, and especially on the Internet and service level,
- How the question affects environments for innovation and competition on the market,

- Which aspects on the issue of openness that are of interest for consumers, considering present and future consumption patterns for electronic services,
- How actors within the public and private areas relate to the issue,
- The meaning of openness in regulated and unregulated conditions,
- The meaning of openness for the possibility of securing access to services.

Based on the analysis of the points above, the government wants PTS to illustrate:

- What the different network operators business models mean from a consumer, innovation and competition perspective,
- What criteria an Internet access should fulfill from a consumer perspective and how these criteria can be measured. (PTS-ER-2009:32, p. 13, my translation).

Although net neutrality is not mentioned within the framework of the task, it is still one of the central issues begging attention by lawmakers and PTS does highlight that this is the case by basing the report on the discussions on “open networks and net neutrality” (PTS-ER-2009:32, p.14). The disposition of the report is made up of three segments which we will analyze to some extent. The first of these is called “Openness on the market of electronic communications” and focuses mainly on developing a theoretical framework. The second, chapter three, “The current situation regarding openness” applies the theoretical framework to the Swedish market. The last chapter, “Conclusions and recommendations” does exactly that, covers the conclusions made and put forward recommendations for lawmakers.

5.1.3 The value-chain of electronic communications

The main tool which PTS use to distinguish between different parts of the electronic communications market is the different levels of the value-chain of electronic communications. It is a matter of trying to establish where different actors operate and under what conditions the market functions at each level. It is, of course a simplification, since many of the levels have levels within themselves, not least of all the IP and transmission levels. The levels are important for our discussions since one of the concerns going into this topic is that different actors talk about different aspects of regulations when referring to net neutrality. Being aware of how the levels differ from each other is a key aspect of understanding the debate, if that concern holds true.

The five different levels are: the natural resources level, the infrastructure level, the transmission level, the IP level, and the service and content level, arranged from the least to the most refined product level. The first two are

generally not a consideration when dealing with net neutrality as they deal with resources such as radio waves, canalization (digging physical structures to put cables and fibers in), antennas, and black fiber and copper fiber allocation and disbursement among other things. (PTS-ER-2009:32, p. 20-21)

The other three are of much greater significance for net neutrality. So, what are the differences between the three top levels? The distinction that PTS draws is the transmission level (or capacity and transmission level) is the sending, transporting and receiving of the electronic signals that make up the information (as in 1's and 0's) in the network. The physical entities are the transmitters and receivers, and the value creating mechanism is the trade with capacity in the networks as well as routing of traffic. (PTS-ER-2009:32, p. 21-22)

The IP level is the level at which Internet operators can give customers Internet access. This is the mesh of addresses and locations on which all content is built, and where we find a large portion of the actors in the parts of the net neutrality debate dealing with open networks, and practices of internet operators, specifically actors that are in general opposed to the general definition of net neutrality. The physical structures on the level are routers that users themselves connect to, and which then connects to the transmission network. (PTS-ER-2009:32, p. 22)

Finally, the content and service level is the level at which you find all the content of the Internet. Websites, servers and user interactions are visible here. Since this is the only visible level for people who are not especially tech savvy, it is also the level of abstraction most readily available in the debate. The actors found here are those that generally are in favor of net neutrality regulations, according the standard definition of net neutrality. It is also, market share wise, the most value creating level of the internet since almost every single application you may find online is created and distributed here. (PTS-ER-2009:32, p. 22)

5.2 The FCC perspective

The Federal Communications Commission consists of an array of different offices and bureaus and from an outside perspective, it is more than a handful to start to understand. It is led by five commissioners where each can hold different views on a matter, so it does create a more diversified perspective on certain controversial issues. In this section we will briefly look at three separate regulations from the FCC, where the two earliest iterations have each been struck down by courts, which in turn has developed the need for new regulations.

5.2.1 Regulation in 2005

In 2005 the commission issued its first policy statement on net neutrality (FCC 05-151), although the words net neutrality are never actually mentioned in the statement. The policy statements did make it to court in *Comcast Corp. v. FCC*

where the Court of Appeals in the District of Columbia ruled against the FCC policy statements legal standing versus Comcast's attempts to discriminate peer-to-peer traffic. This eventually led to the FCC adopting its new rules in 2010. The original statements are as follows:

- To encourage broadband deployment and preserve and promote the open and interconnected nature of the public Internet, consumers are entitled to access the lawful Internet content of their choice.
- To encourage broadband deployment and preserve and promote the open and interconnected nature of the public Internet, consumers are entitled to run applications and use services of their choice, subject to the needs of law enforcement.
- To encourage broadband deployment and preserve and promote the open and interconnected nature of the public Internet, consumers are entitled to connect their choice of legal devices that do not harm the network.
- To encourage broadband deployment and preserve and promote the open and interconnected nature of the public Internet, consumers are entitled to competition among network providers, application and service providers, and content providers. (FCC 05-151)

The 2005 policy statement describes the rights of the receivers and not the obligations of the providers, something that differs from later regulations. Talking about the rights of the receivers, or consumers, there are no technological loopholes that create uncertainty for the actors in the market. The statement does give end users, or consumers, the right to access and run whatever legal application they wish, but they say nothing on what quality that access be, thereby enabling throttling and other forms of bandwidth management. That is to say, with the 2005 statements, consumers got to access content, but the quality of the access was not determined, so in theory providers could discriminate traffic, something that Comcast did and later won court approval for.

The fourth point is not represented by one of the later rules and covers how the market for internet access ought to look. The statement goes pretty far in its demand for competition, saying that providers, application and service providers, and content providers all need to have competition and alternatives for the consumers.

5.2.2 Regulation in 2010

In 2010 the FCC adopted three "basic rules", "grounded in broadly accepted Internet norms, as well as our own prior decisions" (FCC 10-201). The previous iteration had been called a "statement", so reformulating the ideas into rules was an attempt to improve the legal standing of the recommendations. While these

rules do not either explicitly mention “net neutrality”, it is what the ruling is trying to deal with. The rules were as follows:

- a. “Transparency: Fixed and mobile broadband providers must disclose the network management practices, performance characteristics, and terms and conditions of their broadband services;
- b. No blocking: Fixed broadband providers may not block lawful content, applications, services, or non-harmful devices; mobile broadband providers may not block lawful websites, or block applications that compete with their voice or video telephony services; and
- c. No unreasonable discrimination: Fixed broadband providers may not unreasonably discriminate in transmitting lawful network traffic.” (FCC 10-210)

One thing worth noting is that neither rule include wireless broadband access that does not originate from a fixed or mobile connection in the first place. Since it is not uncommon that wireless internet access is available in, among others, public areas, it creates an interesting loophole. Where the definitions from PTS was based on receivers and providers, the FCC only regulate the providers. This creates a situation where users cannot demand anything for themselves, but only demand that providers fulfill their end of the bargain. It makes the regulation hollow and unable to adapt to new innovations.

The first point of the ruling is roughly similar to the last point in PTS’ definition, namely that ISP’s need to inform about or disclose how they manage network capacity and access, and what the terms and conditions of the service is.

The second rule creates different rules for fixed broadband providers and mobile providers that might cause some problems deciphering it. Fixed broadband providers cannot block “lawful content, applications, services, or non-harmful devices”, meaning that as long as the content, whatever it may contain, is lawful, a fixed broadband provider cannot block it. The mobile broadband provider however, only need to avoid blocking “lawful websites, or block applications that compete with their voice or video telephony services”, leaving out an option to block “services” or maybe even “non-harmful devices” that connect to the mobile networks.

The third rule only applies to fixed broadband providers, stating that they may not “unreasonably discriminate” network traffic. What is reasonable is of course up to distinguish by the providers themselves, and eventually by a court, if the FCC decide to act on that rule. Mobile broadband providers are completely exempt from this rule and may freely allocate their traffic priorities as they please.

5.2.3 Regulation in 2015

In 2014 (Fung 2014) the FCC guidelines from 2010 were subject to a court decision that declared them invalid. As a response, the FCC adopted new rules in February of 2015 and took a distinctly new approach from the previous regulations. The new guidelines are so called “bright line” rules, meaning that they give very little room for interpretation of the rules. They are also a huge step towards the internet activist and content provider perspective on net neutrality, differing from previous regulations made by the FCC. The bright line rules are as follows:

- No Blocking: broadband providers may not block access to legal content, applications, services, or non-harmful devices.
- No Throttling: broadband providers may not impair or degrade lawful Internet traffic on the basis of content, applications, services, or non-harmful devices.
- No Paid Prioritization: broadband providers may not favor some lawful Internet traffic over other lawful traffic in exchange for consideration of any kind—in other words, no "fast lanes." This rule also bans ISPs from prioritizing content and services of their affiliates. (FCC 15-24)

The new rules have been celebrated by some as a win for “true” net neutrality, and we will deal later with why that might be a problematic concept as well, while others have berated it for being not far enough, or way too far reaching. Barbara van Schewick, a Stanford law professor, gives five reasons why she thinks it does not go far enough in an article in the MIT Technology Review:

- First, the anti-throttling regulation does not clarify exactly what is prohibited (should it cover specific applications or classes of applications?),
- Second, it is unclear how it affects zero-rating deals from broadband providers where users get access to certain sites for “free” while other sites cost money or count towards a limited amount of traffic;
- Third, she thinks that the exemption the FCC gives broadband providers when it comes to “network management”, that is adjusting prioritization of traffic to make sure that the internet does not get clogged in times of heavy use, might be misused;
- Fourth, the FCC should clarify what is meant by discouraging the use of “practices related to interconnectivity” to circumvent the net neutrality regulations, as this is something that is done today in a number of different arrangements.
- Fifth, van Schewick argues that the new rules do not effectively deal with how to monitor internet traffic for violations. The method of monitoring through transparency reports is a previously tested method that has been shown to be too slow for regulators to keep up with the practices of providers. She mentions that one method would be user reports of abnormalities through FCC applications. (Anders 2015)

Brent Skorup, a research fellow of the Mercatus Centre at George Mason University, criticized the new rules by saying that net neutrality is not neutral, and that rules as applied by the FCC remove the ability to create more innovations from the private sector as they are not allowed to compete with certain tools anymore. He claims that this is a step backwards to a command-and-control economy, implying that this is something very negative, where the state controls exactly what is and is not allowed on the market. (Skorup 2015)

While these two comments are far from the only ones, it is hard to tell what the regulation will actually do to the market, and as the rules were to be implemented on June 12 2015, they will not have been implemented long enough for any report to come out of either the FCC or any actor on how the rules apply.

6 Analysis

In this section we will look at the four modalities of regulations in the New Chicago School theory. We will take them in turn, and see how each constrain has acted on the net neutrality debate. This will be tied together in the conclusion of the thesis, in chapter 7.

6.1 Analysis - Law

From the outset, net neutrality may seem like an issue that mainly consist of legal aspects. Either the state introduces legislation that makes sure that internet operators may not discriminate any single packet of information over any other packet of information. Or the legislative bodies make sure that internet operators are free to use their infrastructure in whatever way they deem necessary.

But, the reality is of course not as simple, and therefore the debate continues, and there are more factors to take into consideration. So in this section we will try to determine how Law influences the question of network neutrality and in the subsequent chapters we will also investigate how the other regulators constrain net neutrality. We will look at a few different parts of the law, as well as suggestions and hypothetical alternatives that have been posed.

6.1.1 What changes have been proposed, and how does that affect net neutrality?

One of the most drastic suggestions, at least from a market and architectural perspective, have been the suggestion that the law should prohibit internet operators to treat some data differently from other data, and from selling prioritized positions in the networks to content holders. This, in essence, is what the FCC did in early 2015 with the new proposed net neutrality rules.

According to Lessig, this is not the law affecting net neutrality directly, but rather the law setting up limitations for the architecture and market, thereby regulating the issue indirectly. As the architecture is the code and the infrastructure that make up the internet, any rule that prohibits certain treatment of data is a regulation of the architecture to get the desired effect in the issue. The prohibition on paid prioritization is also a market regulation where a specific segment of the market - i.e. prioritization payments - is in effect completely removed. The price mechanism stops being a factor in that segment, removing the markets ability to regulate there. The proposed regulation is indirect and it will be

self-executionary, it is objectively ex post and since we do not yet know the punishment for breaking the rules we cannot tell whether it subjectively will be ex post or ex ante.

The same type of legislation has also been proposed in the European Union, most prominently by the European Commission in 2013 (European Commission 1). The Commission led by Jean-Claude Juncker, together with the European Parliament and the European Council - the so called triad, has put forward a suggestion on banning paid prioritization on the open internet (European Commission 2). This has been criticized by some as creating a loop hole in the net neutrality as “open internet” does not include an area called “specialized services”. With specialized services not a part of net neutrality, according to critics, ISPs may start selling packaged deals not labeled as “the internet” but are instead a “specialized service”, and thereby they escape the demand for net neutrality. In such a case, it would probably make the regulation subjectively ex post as ISPs would presume that specialized services can be customized according to their best interest. Determining what exactly makes up a specialized service will either have to be clarified by legislators, or most likely, by courts. (Moody 2015)

The previous instances of FCC regulations, as described in the background, were a lot vaguer and did not explicitly mention net neutrality as their aim or intent. The 2010 rules differentiated between different types of connections, where fixed broadband connections, mobile broadband connections and wireless broadband connections had different rules applied to them. This is a regulation of the protocols of the internet, or rather of communications protocols, and we will deal more with that in the analysis of architecture.

6.1.2 Are there other kinds of legislation that affects net neutrality?

Another model that exists in some place, although it is not always necessarily enforced by law, is the open access model where the transportation layer of the internet either has a (usually) state monopoly actor, or there has been either a national law, or local rules that all actors, last mile ISPs, should have equal access to the underlying infrastructure so that consumers will have a larger and more competitive selection to choose from. In this way the law removes competition from the transportation layer, thereby enforcing, at least to a certain extent, a kind of net neutrality on that specific layer. This regulation works indirectly through changing the architecture and the market in different ways. Through architecture it makes it regulate access ex ante, both objectively and subjectively. Through markets, it increases the chance of competition in the infrastructure, thereby making prices fall as actors have to compete on both prices and service. It will make prices regulate transmissions objectively ex post, and subjectively ex ante as it will not serve an ISPs market share to challenge the regulation.

It is a different tool than not allowing blocking or paid prioritization as it only regulates access to the underlying infrastructure for top level ISPs, not for the services or competition that the ISPs have on the top layers.

The opposite application of law, a situation where ISPs can freely create different access solutions and regimes, would perhaps lead to a larger variety in different forms of connections, and the emergence of what some have dubbed the cable-TV-internet. This is a situation where consumers pay for the content that they actually access, maybe with a few “free” sites that can be used without additional charges. In these cases, the regulation of law would be applied to making sure that people do not create schemes to break the contracts that they have gone into with the ISPs.

Furthermore, some copyright holders and security organizations have called for an internet where ISPs or the government checks all packages of information for what they contain to determine, for example, if it is something that violates copyright and should be charged extra, or if it for some reason contains something else illicit. The consequences to net neutrality in those cases would be that the law would discriminate every single package of information based on what it contains, creating an internet that is far from neutral. (Cleveson 2014)

This regulation would be executed when someone enters the internet. Depending on if the filter would block or just identify and then charge for the copyright violation, it would be either objectively and subjectively ex ante (blocking) or objectively ex ante and subjectively ex post (charging). In both cases it would be a direct regulation on the issue, copyright infringement, but an indirect regulation on net neutrality. It is also sure to create tensions between all the different constraints.

6.2 Analysis - Markets

While markets have been analyzed for decades, or even centuries, often it has been within the field of economics. As an abstract concept, philosophers have also dealt with how it affects our society (or to what extent it should be considered an integral part of society). Here we will look at how markets act as a modality of regulation. How do markets constrain net neutrality?

According to Lessig, in the most basic sense, markets constrain purely on the logic of supply and demand, as this is what sets the price. Objectively, price is only a transaction cost, based on the supply and demand on the market. With completely rational actors, it should make it a fairly predictable modality to analyze, however, that does not seem to be the case. Because, subjectively, even the market actors may act irrationally. Tim Wu argues this point in his 2003 introduction to the concept of net neutrality:

“But might network neutrality be accomplished without any regulation at all? Basic economic theory suggests that operators have a long-term interest coincident with the public: both should want a neutral platform that supports the emergence of the very best applications. However the evidence suggests the operators may have paid less attention to

their long-term interests than might be ideal. A 2002 survey of operator practices conducted for this paper suggests a tendency to favor short-term results.” (Wu 2003)

6.2.1 Have things changed since 2003?

First, let us identify who actually controls supply and demand. On the supply side of net neutrality, we have the internet service providers, divided into two sub groups, backbone providers and last mile providers. The supply in this case, is bandwidth and access to the internet. With backbone providers, we mean internet service providers that own and operate the fundamental infrastructure, level two and three of PTS’s defined tiers. With last mile providers we mean the internet service providers that deal directly with users by transporting information from the units the users operate, to the infrastructure that can connect them to everywhere else.

On the demand side of the market are the users and creators that provide the internet with its substance, the content. It can be in the form of culture, or email, or storage, or other forms of services. These are the actors that need and want access to the internet to be able to do everything else they want to do. The demand side is often characterized as small creators or normal internet users, but also includes tech giants such as Google, Netflix, Apple and many others that require the internet to deliver their respective products.

6.2.2 Misplaced equilibrium

Previously, we looked at the case of Telia proposing to block access to Skype in 2012. Telia was facing what they perceived to be a problem: Customers were using their mobile internet access, provided and purchased by and from Telia, to call friends and family using Skype. Since Telia is also a telecommunications operator, coming out of the telephone industry, and because the internet access was included in the consumer's' telephone plan, they reasoned that they were subsidizing competing products on their network. This was not the first instance of telecom operators wanting to block VoIP services like Skype. Already in early 2011, 3 (owned by Hi3G), was quoted, in an article about blocking Skype, Viber and Tango-like services, as saying: “We consider this a breach against the demand for “fair use” that customers are required to follow. We think that these types of services are like hot wiring the electric grid” (Brohult 2011, my translation). 3 has later denied that they made this statement, and remained reserved during the 2012 discussion on blocking. (Karlsten 2012)

To some extent this is question of technologies, or even architecture in the sense that this thesis covers, but first and foremost it is a market constraint. Markets constrain through the price mechanism. In this case the supply is bandwidth to VoIP services. And the demand is consumers wanting access to VoIP. However, the supplier does not agree with the current pricing equation and

decides to remove the ability to connect to certain services unless a price floor is met, i.e. paying a premium price. One of the reasons why Telia is acting this way is that data transactions also carry a cost. Relative to the telephone networks and wireless services, data traffic is much more cost intense for the ISP. It therefore seems rational for them to react this way when costumers are using a costly (from the perspective of Telia and other ISPs) form of communication to compete with a cheap form of communication, all while the ISP are supplying both. What we end up with is that the constraint implemented in this example is a supplier who is unwilling to accept the price it has already set for a service due to a perceived violation of “fair use”.

As we also described previously, Telia decided to go back on their plans to implement a blocking of Skype, claiming that it was “too complicated” (Zirn 2012). The ban first tried via Telia’s Spanish subsidiary Yoigo turned out unsuccessful. However, Telia also raised their prices by a fairly substantial margin to cover the perceived losses. They therefore, again, changed the balance of the market to find a new equilibrium.

Telias blocking of Skype is partly a case of the market indirectly regulating price through the use of architecture, as Telia is the controller of both in this case. The blocking is executed at all times, and does not require enabling by any other action. It regulates objectively and subjectively ex ante, as it uses architecture to change the price equilibrium. We also learned that Telia took a large hit in the public debate as the public opinion (norms) did not agree with the decision, so Telia had to take their decision back. This is a very interesting evidence of constraints clashing. With changing the price however, they again regulated, but this time with an execution that requires agency (as in you need to sign up for the service), but still objectively and subjectively ex ante.

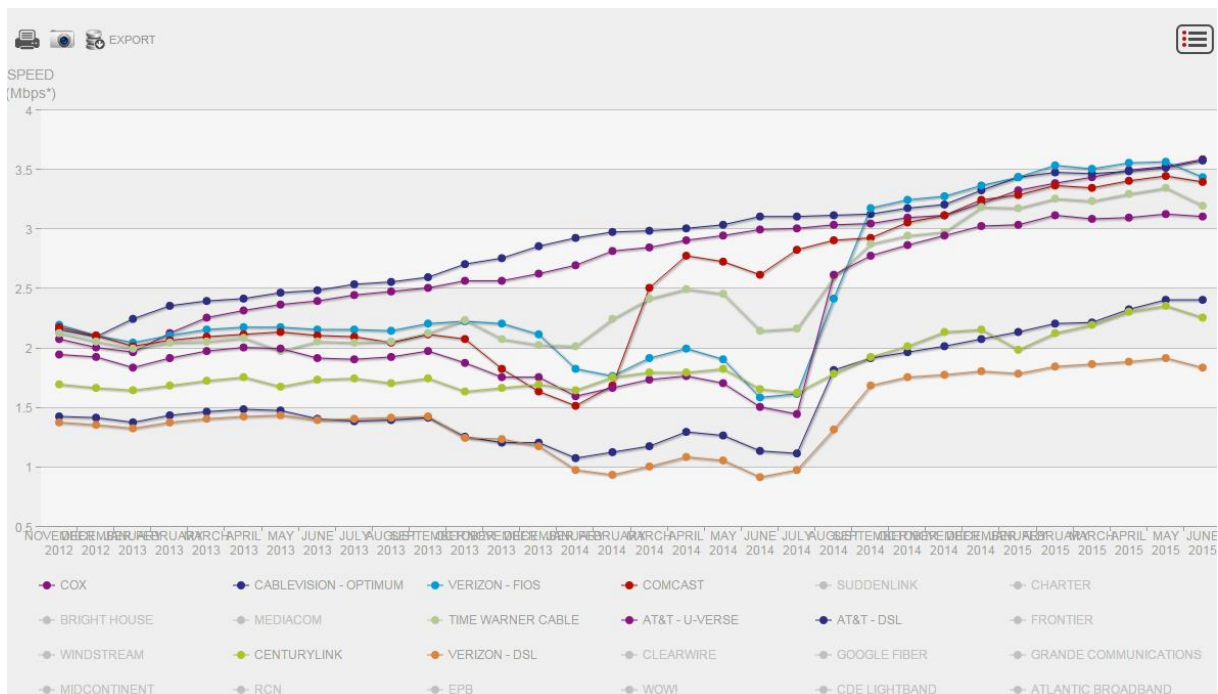
6.2.3 Manipulation of supply

In the case with Netflix and Comcast, and the negotiations that took place between them in 2013 and 2014, the problem is slightly different. When Telia wanted to block Skype, VoIP was one of the most voluminous uses of bandwidth in mobile broadband. On normal connections, fiber broadband that is, illegal file sharing was what took up a large share of internet traffic. At one point, The Pirate Bay, a famous website for finding torrents, was responsible for about 40% of the total internet traffic (BBC 2013). In the September of 2013, a study claimed that about 24% of the internet traffic was made up of piracy (Sankin 2013). In 2014, it was estimated that Netflix stood for about 34 percent of the US internet traffic at peak hours, having pretty much taken the place of The Pirate Bay as the quantitatively largest source of online media consumption in the world. (Fitzgerald 2014)

This is the background to why ISPs such as Comcast and Verizon wanted so called interconnectivity agreements with Netflix. They reasoned that since Netflix

took up such a large swath of internet traffic, there was reason to settle an agreement. As with the Telia example, we have an ISP that has misjudged how consumers want to use the data traffic they have bought. And data traffic also carry costs for the ISP. So if Comcast has planned for an average consumption of 1 Gb per month, but instead the consumer uses up 50Gb on the same connection, it is an unwelcome situation and the ISP needs to compensate in some way.

The interconnectivity agreements would solve the problem by doing two things: First, Netflix (and others who take up a large proportion of traffic, like Google with Youtube) would have to pay an fee to the ISPs and thereby carry the increased cost for the ISP of increased traffic and, secondly, if they payed, they would be able to secure good service from the ISP by setting up a stronger link between the servers hosting the content, and the network by which it is later distributed. These are the interconnectivity agreements. And as Image 2 (Image 2: Netflix 1) below shows, it had tremendous impact on quality of delivery.



What the graph shows is that in early 2014, a deal was struck between Netflix and Comcast, making the Netflix speed on Comcast networks shoot up. In mid-2014, the same deal was struck with AT&T, Verizon and Time Warner Cable.

It is, however, noteworthy to see that before these deals were struck, the speed of delivery for Netflix dropped on each of these networks. From this we can gather two things, as it relates to the constraint of the market.

First, the ISPs appears to have been manipulating supply to some users of the internet in order to pressure them in negotiations on paying extra costs: It is possible to manipulate supply to get the price you want. And secondly, quality of service is important enough for content providers, the demand side of the equation, to be willing to pay for that possibility of improved services. We have a manipulation of supply in order to get a more desired price.

The regulation of manipulating supply is again the market indirectly regulating price by regulating architecture (again, since the ISP controls both). It does so by agency, since they do not have to, they just want to, and they do it objectively and subjectively ex ante, as in it goes down right away. It has also clashed severely with the regulation of norms, and is one of the reasons why the FCC ruling from 2015 is so much harsher than previous rulings.

The regulation of interconnectivity agreements is the market changing the price by letting the content distributors take the costs. It does this objectively ex post, since if the bills do not get payed, law will intervene. Subjectively, it regulates ex ante, as content distributors want good service and therefore will not argue once the deal is struck. It is not clear how the interconnectivity agreements will continue, so there is no indication of a clash yet.

6.2.4 Content creators are also market actors

It is worth noting that in the two examples above, the content creators, Skype and Netflix (and of course many others) are also market actors that use price as regulator. Up until this point, Skype has not begun charging for its general service, but they have introduced the ability to pay to connect to landlines and normal phone services. Since most attempts to regulate access to Skype have failed, there has been no real need for them to change their pricing scheme in a mayor way.

As for Netflix, they have also retained the same pricing model as previously, but have a tiered system depending on the quality and number of screens you want to access the service with. Netflix has not increased prices for consumers based on the interconnectivity agreements, but time is to tell whether that will happen eventually, or if prices would have been lower without the agreements anyhow.

6.3 Analysis - Norms

The constraint Norms described by Lessig is not vague or hard to define, even though that would be a general impression that most will have of norms. Within this context it is a force by which the community, be it one or many, sanctions a breach of something that the community deems correct. Identifying what norms are in place and how they are acted upon is a whole different matter.

Community itself takes many different forms. It can be the citizens of a nation state in general, or just your village, or your subgroup on an online forum, or even the fan base that you are a part of. Each community has different rules that are enforced by the community to some extent. In some communities it is a palpable rule book (like in sports), and in some the rules are that there are no rules, and you will instead be chastised if you try to enforce other values or rules on that community.

So, when discussing the constraint of norms, as defined by Lessig, we must also identify which communities are relevant for the discussion. We must then find what norms these communities enforce on each other and on others. Finally, we must describe how these norms affect the question of net neutrality.

6.3.1 What communities are active in the debate on net neutrality, and how do they act?

It might be necessary to state that the public debate does not make up the entire social norm that constrain net neutrality. A lot of discussion goes on in the comment sections on Facebook, but is generally, and rightly so, hard to track down. The public debate is therefore where we will have to make our effort to find normative behavior.

6.3.2 The proponents - activists

The group most active in enforcing some form of norms are the activists fighting for the “freedom of the internet”. These groups come on many different forms, from political parties like the Pirate Party, to hacktivist groups such as Anonymous, to NGOs such as the EFF (Electronic Frontier Foundation) and other more or less cohesive groupings.

These groups are all proponents of a net neutrality where no, or at least very few, type of information is treated differently from any other type of information. On a vote in the European Parliament declaring the Parliaments wish to enforce net neutrality – in this case a legal protection against all forms of traffic discrimination – in the European Union (the vote has not led to a clear net neutrality position of the European Union, something which is still being discussed), the Swedish Pirate Party MEP Amelia Andersdotter called the result “a victory for the free competition, democracy and for a living culture” (Piratpartiet 2014). The EFF declares net neutrality “a principle that must be upheld to protect [the] future of our open Internet” (EFF 1). Anonymous is of course not a cohesive organization, so statements from them should be taken lightly, but various different accounts claiming to be Anonymous have condemned the FCC for the abolition of the previous net neutrality rules (Video from Anonymous 2014). However, they also celebrated the FCC’s rules from early 2015 (AnonHQ 2015).

The norm that these this group is enforcing can be summarized as follows: “The internet should be equal for all end users”. An end user is someone who is at the end of the value chain of the internet, using or distributing content and services on the existing infrastructure. Equality for the end user means that no matter the service or content that you are trying to distribute or access, your internet service provider should treat every request with just as much bandwidth and with the same prioritization as every other package of information.

Anything interpreted as a breach of this principle is met with staunch opposition and calls for rallying other activists with tools such as opinion pieces, to comments on various internet forums such as Facebook or Reddit. Even the recent success of the 2015 net neutrality rules from the FCC are treated with skepticism from some activist groups that are still raising money. (Free Press 1)

After the 2010 FCC rules were struck down in early 2014 (Fung 2014), the authority decided to have an open call for opinions on a new net neutrality regulation (FCC 1). The then newly started HBO Last Week Tonight with John Oliver had only run four episodes when they decided to cover the net neutrality issue. With the long form segments on the show, John Oliver could use 13 minutes to explain a view of net neutrality very much in line with what internet activists have argued. In the end of the segment, with the words “Turn on Caps Lock and fly, fly my pretties”, Oliver called for his viewers to submit their own comments to the FCC, with the expressed purpose of getting the authority to implement strong net neutrality rules. Three days later, the FCC comment system had crashed due to 45 000 public comments (Brody 2015). In September, the call for public opinions ended, and a total of 3.7 million comments had been made, vastly surpassing any previous call. An analysis from the Sunlight Foundation on the first 800 000 comments found that about one percent of them were opposed to net neutrality. (Lannon - Pendleton 2014 and Hu 2014)

The social sanctions of the norm were to show policy makers that people cared about net neutrality, and to push more people into caring about it. That sanction must be said to have worked. As regulations by norm, these suggestions require agency to actually constrain actions. Objectively and subjectively they regulate *ex post*, at least if considering the sanction activism. While norms usually are not subject to restrictions by other constraints, norms do act as a barrier for the other constraints in this subject, making certain lines of action very difficult to uphold, as seen with the Telia and Comcast examples. In the end, this normative sanction coincided with a legal process, pushing a certain legal alternative to be the most viable solution to the problem.

6.3.3 The opposition - Pro ISP advocates

An arguably less successful norm has been that of, a bit bluntly put, “let business do what business does”. In this line of arguing, a neutral net is a problem as it does not let ISPs compete by requiring actors who put pressure on the network’s capacity to pay extra for the extra effort in optimizing delivery. The practice of discriminating or demanding those forms of payment was covered both in the background and will also be covered in the analysis of how markets constrain net neutrality. But in this section it is about the normative force this perspective has had.

Much like the previously mentioned norm of “freedom of the internet”, the enforcement of the norm has taken place in opinion texts and public debates. However, this side has had much less success in getting crowds on their side, therefore limiting the possibility to actually sanction violations of the norm. In

Forbes, Josh Steimle wondered if he was the only techie opposed to net neutrality (Steimle 2014). The main advocacy group for the ISPs, the NCTA - the National Cable and Telecommunications Association, want an “open internet”, saying that regulation would stifle innovation (NCTA 1). And former FCC chairman Michael K. Powell also argued that the internet is not so sick that it needs an injection of regulation (Powell 2014).

That being said, this group has not had the same success as the pro-net neutrality groups have had, and it is hard to properly evaluate in what way they have tried to implement social sanctions in other ways. Some sanctions, such as Comcast’s decrease in delivery of bandwidth during negotiations with Netflix could probably be interpreted as a social sanction, but fits better both as a market mechanism to some extent, or maybe as an evidence of the constraint of architecture.

In the same ways as the other norm regulation, the opposition requires agency to enforce their, admittedly not very powerful, regulation. Their regulation is also both objectively and subjectively *ex post*, and it has not seen any conflict with other constraints, unless you count the activists that also use norms.

6.4 Analysis - Architecture

Besides the law, the point that Lessig really wants to make with his theory is showing and explaining how architecture acts as a regulator. How architecture constrains. In the *Handbook on the Politics of Regulation*, the New Chicago School Theory is dealt with under a chapter specifically on internet regulation (Murray 2011, p 272). The reason for this is that it is a theory that, more than others, highlight how to view architecture in general and the internet specifically, in terms of regulation. One aspect to why Lessig focuses so much on architecture, and why the theory appears to be applied internet regulation, is that code can regulate in many different ways.

Code is, literally, the building blocks of the internet. And it is the building material which a lot of our modern world runs on. Since net neutrality is a question with a strong focus on technology and the internet in general, it is safe to say that architecture, i.e. code, plays a major role in how it is being regulated. It is therefore also difficult to describe or even identify every kind of architectural regulation. I will look at two types of architectural regulation in net neutrality: First and most importantly, how protocols regulate (and work). Secondly, how the layers regulate.

6.4.1 Protocols regulate

Protocols are “the blueprints that enable technical interoperability among heterogeneous technology products” (Denardis 2009, p. 6). This means that protocols dictate how information (“binary streams” (Ibid.) of 0’s and 1’s) are to

be interpreted in different circumstances so that different parts of the internet and different technologies can communicate with each other. Much like blueprints in real life describe how different systems fit together, or how municipal planning maps say how the infrastructure of the city should work and develop, protocols say what should go where and how it should be interpreted within an electronic network. Some famous protocols that Denardis mentions are MP3, Wi-Fi, Bluetooth and HTTP.

Since the net neutrality debate is a discussion on whether all information should be treated equally on the internet or if internet operators are allowed to prioritize certain information above others, protocols regulate everything within the net neutrality debate.

Take for example IP, Internet Protocol, which is what the addresses online. An IP address is an identifying sequence of numbers that gives information about who the sender or receiver of a data package is. Knowing this allows someone to take specific actions against known IP-addresses, be it slowing down traffic they can control, or send an email. “If IP is the least common denominator for communicating over the Internet, and the one protocol used in every instance of Internet connectivity, one can envision that this protocol would be relevant to a number of concerns and of interest to those seeking greater control of the Internet” (Denardis 2009, p. 9)

Denardis notes, much like Lessig, that protocols and technology have political impact. She says that protocols have embedded values, reflecting the “socioeconomic and political interests” (2009, p. 10) of those who wrote the code. In our discussion this means that protocols, to the extent that they can change or new ones can be introduced, are at the mercy also of those who can control the flow of data.

It is, however, difficult to determine exactly how they will affect net neutrality on aggregate. Some protocols work towards allowing free flow of information on the network, some are more restrictive, some are filtering and some are circumventing filters.

So protocols regulate net neutrality without the need for agency, it is a self-executionary regulation, unless you have the ability implement new protocols but that is not likely. Protocols also regulate objectively and subjectively ex ante. As for the relation to other regulations protocols pretty much set the scene for how the other regulations may act on the internet. And finally, there are definitely clashes between regulation by the architecture protocol and other modalities of regulation. Since protocols form the basis for most other regulation online, it has a big impact on the plausibility or effectiveness of other modalities of regulation.

6.4.2 Layers regulate

In architectural terms, the layers of the internet is probably what most people would associate most acutely with “normal” architecture. The layers of the internet are defined somewhat differently by different actors. In the background, we learned that PTS in Sweden defines five different layers in the value chain of

the internet. Denardis identifies four different layers, based on her theory of protocols. Barbara van Schewick also uses a similar layout as Denardis, identifying four different layers (van Schewick 2012, p. 84). The main difference is that PTS adds a natural resources level that does not really require protocols or software, since it is the physical cables that the information later travels through. So the terminology “value chain of the internet” and “the internet” encompasses a few different things. The OSI model of the internet, that was also mentioned previously, divides the internet up in seven layers of communications functions.

Layer	Function	Example
Application (7)	Services that are used with end user applications	SMTP,
Presentation (6)	Formats the data so that it can be viewed by the user Encrypt and decrypt	JPG, GIF, HTTPS, SSL, TLS
Session (5)	Establishes/ends connections between two hosts	NetBIOS, PPTP
Transport (4)	Responsible for the transport protocol and error handling	TCP, UDP
Network (3)	Reads the IP address form the packet.	Routers, Layer 3 Switches
Data Link (2)	Reads the MAC address from the data packet	Switches
Physical (1)	Send data on to the physical wire.	Hubs, NICS, Cable

Image 3: An OSI-model by Coplex. (Coplex 1)

Either way, different actors operate on the different layers on the internet. The top layers are in a dependent relationship to the lower layers as they need access to the internet and the lower levels transport the bits, and the lower layers are only dependent on the top layers as customers that buy bandwidth.

Therefore, as some internet operators also operate on different layers at the same time, the ownership and control of different layers at the same time would make it possible for an internet operator to transport its own data with higher quality than competitor that do not have the same ability, as they only operate on one layer. This has been a fear in much of the net neutrality debate, that operators would abuse this position, but it appears not to be such a big problem at the time of writing this text.

Layers also regulate in that if you are working on the top layers, they you are bound by the rules set on the lower layers. In the original architecture of the internet, and mostly also today, those rules are often very loose, neutral, and allow for a large variety of applications. But it is also easy to imagine that not all outcomes are possible due to certain preferences manifesting in the code. In a very real sense therefore, all consecutive layers are bound by how the lower layers

have been structured, what types of cables are laid out, whether IPv4 addresses are available or if the layer above is actually made to run IPv6 as well.

As with protocols, layers are self-executionary. Sure, you have a sort of agency that additional regulation in the form of actually manipulating access and abusing ownership of different layers may regulate further, but from the outset, layers are there and will regulate. Also, as with protocols, they regulate both objectively and subjectively ex ante, and since they are another fundamental in internet politics, they frame the arena on which the other regulations may work.

7 Conclusions

With an increasing reliance on the internet in our daily lives, it becomes increasingly important to understand how the internet is governed, and what stake public and private institutions respectively have in that arena. One of many issues emerging from that discussion has been that of network neutrality.

If you would take a snapshot of all that is written about net neutrality online, you would mostly end up with the description that net neutrality is about internet Service Providers being legally mandated to never treat any package of information differently from any other packet of information. That, from the perspective of the end user, the traffic is treated in a neutral manner.

In this thesis, we have studied how different types of constraints regulate net neutrality, or the discrimination and customization of internet traffic. These constraints are a part of the New Chicago School theory, developed by professor Lawrence Lessig. Law, Markets, Norms and Architecture all act as modalities of regulation and constrain the behavior and actions of a thing. In this case, the thing is net neutrality.

7.1 The constraints

We have constructed an analytical tool based on Lessig's theory, where we look at whether the different constraints need agency or are self-executionary, whether they regulate ex post or ex ante, objectively or subjectively, whether they are used directly or indirectly, or maybe even if they have counter acted each other in any way.

Having established the theory and analytical tool, we have managed to categorize certain aspects of the net neutrality issues. We can now say that more than any other regulation, architecture forms the very foundation on which all other regulations act and must relate to when it comes to net neutrality. Both protocols and layers create distinct regulation, objectively ex ante, and any other regulation has to take architecture into account. It is also hard to identify in what direction architecture regulates, where it wants to go, as it is such a fundamental aspect of net neutrality. Saying that the internet was always free and should remain so does not give us a direction.

We have also established that law is the regulation where we can most clearly see how it may be used, and it is where a large portion of the debate has taken place. The main discussion regarding law is whether it can be mandated in legislation that ISPs should not be allowed to discriminate any form of data transfer in relation to any other form of data transfer. Such a regulation would not

only act on architecture and protocols to make sure that it acts in certain ways, but would also remove a segment of the market where ISPs would no longer be allowed to compete. Such a regulation has now been introduced in the United States, and there are political suggestions for it also in the European Union. The regulation is indirect, objectively ex post and most likely subjectively ex ante. And it will interfere a lot with both markets and architecture. Other aspects of law would be less harsh, by perhaps imposing an open access model that will increase competition among the ISPs and improving their practices that way.

We have learned that even if it might not seem like it at first, internet activists are many and they are very interested in net neutrality. Not only were they spurred by an immensely popular TV-show to write into the FCC in their call for comments, they have also affected that TV-show in the first place, and it converged with the open call. 3.7 million comments later, the FCC went for a regulation that was very different from previous attempts, and it was in line with the activist norms on net neutrality. While the norm is not the harshest regulation, enough people can turn it to a very effective modality. It regulates ex post, and it requires an enormous amount of agency, but once enabled, it constricts the possibilities for the other modalities in a very tangible way.

Finally, we have learned that markets have been the area where most regulation has taken place up until this point, and where the issues have really come to light. While it only regulates based on the price mechanism, we have seen that the price mechanism is a lot more complex than one might first expect. When Telia tried to block Skype, and when Comcast tried to strike a deal with Netflix, the market indirectly regulated through architecture to adjust a price equilibrium what had spun out of hand. In the Telia case, norms even made the company have to step down from its policy. In the Comcast case, we have yet to see how the interconnectivity agreements will pan out after the new FCC regulations are in place.

7.2 Evaluation and research suggestions

Another aspect of this thesis was to develop the New Chicago School theory into an analytical tool that could be better used to structure and understand regulatory issues. From the outset, Lessig's theory is structured around a few hypothetical examples, and he does not develop a tool to properly export an analysis to other fields of study.

Finding a structure that could be used as an analytical tool proved to be fairly easy after all. Lessig develops some of his definitions in an appendix, adding the complexity of agency and self-execution, as well as objective and subjective regulations. A part of the book where he describes how indirect regulation can backfire was developed into the analytical tool of constraints counteracting each other.

The real problems with the tool came instead when the analysis began and there had to be a selection of sources. Lessig, again, does not give any instructions

on how to develop the theory further, and since there is no previous research to take selection of sources from, it was a matter of identifying representative cases to the best of my knowledge. All of the aspects that have been analyzed in the thesis are relevant, and play a role in the regulation of net neutrality, but there is also a thousand other things that could have been looked at if the scope of the thesis had been bigger, and my time had been endless.

7.2.1 Continued research

Lessig's theory is beneficial if you want to structure a problem of regulation and think of different modalities and how they affect a thing. As such, this theory is well worth continuing to develop and use on other areas of policy and regulation analysis. Most importantly because it highlights the importance of other modalities of regulation than law specifically.

For other researchers, a key aspect is continuing to develop the analytical tool and partly fine tune it for application in more narrow areas, but also make it more generalized so that it can be applied to more varied areas of research.

As for net neutrality, research has to go into evaluating how the new frameworks are going to work in the US, but it is also necessary to look at how different modalities of regulation may counteract the legal side of things.

All in all, more effort should go into understanding the many variations of regulation that take place every day, outside of political assemblies and court rooms. If more regulators take that into account, that's not nothing.

8 References

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8.2 Images

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Image 2. Netflix 1. Graph taken from Netflix’s USA ISP Speed Index. <http://ispspeedindex.netflix.com/results/usa/graph>. Screenshot taken 2015-07-16.

Image 3. Coplex 1. Table taken from Coplex IT Learning. <http://coplex.co.uk/cisco/osi-model-explained/>