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The Telecommunications in the European Union

An Effective of Defective Market?

Date: 31-05-2015
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Abstract

Since the telecommunications is one of the fastest growing parts of the world economy (Economides, 2008:469), it attracts a lot of attention within the political, economic, technical and social domains. The current situation and potential should not be underestimated. The Internet, alone, brings between $2-3 billion per year (Center for Strategic and International Studies, 2014). The potential and benefits from the digital economy are of importance for other sectors such as retail, transports, financial services, manufacturing, education, healthcare, media, among others (European Commission, Digit/008/2014). But what can happen in case this industry is not efficient? What is meant by lack of efficiency is that this industry does not contribute to job creation, economic improvements or innovation.

This paper takes as a stand point that there are gaps in the industry and argues that a bridge between consumers and industry participants should be built. It is furthermore assumed that in order to do so, regulation must be in place. Behind the data analysis and theoretical considerations for the research are two theories and three criteria. The theory of policy analysis and oligopoly give the theoretical frameworks while the criteria for analysing policy outcomes are effectiveness, efficiency and consumer and data protection. By combining these theories with the gathered data, an industry's overview is given.

Analysed through the prisms of the theory of policy analysis, effectiveness and efficiency are criticised due to the final outcomes and sometimes, poor results. Policy analysis supports, however, the General Data Protection Regulation (GDPR) as the outcome of it complies with many of the issues which the industry experiences. A more in-depth analysis can be made once the regulation is implemented so the outcome can be evaluated.

Last but not least, the theory of oligopoly focuses mainly on firm's behaviour. The gaps in policy's effectiveness and efficiency can become burdens for firms and their contribution to the European economy. It can also lead to poor services which consumers can experience. Finally, the GDPR can both be a stimulator and a burden for companies as it sets rules for data processing and fines. The empirical data overall supports the theory of oligopoly except that the EU sets the prices which contradicts the theory of price regulator.

Contents

List of Abbreviations

1-, 2-, 3-, 4G	1st, 2nd, 3rd, 4th Generation of Mobile Network
AI	Artificial Intelligence
DAE	Digital Agenda for Europe
DSM	Digital Single Market
EC	European Commission
ETNO	European Telecommunications Network Operators' Association
EU	European Union
GDPR	General Data Protection Regulation
ICT	Information, Communication and Technology
IoT	Internet of Things
IP	Internet Protocol
ITU	International Telecommunications Union
MS	Member State(s)
OECD	Organisation for Economic Co-operation and Development
OTT	Over-the-top
R&D	Research and Development
SME	Small and Medium-sized Enterprise(s)
SMS	Short Message Service
WTO	World Trade Organisation

List of Tables:

Chapter 1.Introduction

Long-distance communication changed drastically since the invention of the first telegraph in 19th century. Two decades later, mobile communication is used worldwide on a daily basis due to the network evolution, technology development and social pressure (Maille and Tuffin, 2014). The International Telecommunications Union (ITU) estimated that in 2010, 90% of the global population had access to a wireless network. More than 2 billion people could access the Internet from home, where 65% of Europeans can do that in comparison to 9.6% Africans. Moreover, the number for mobile-cellular telephone subscriptions in Europe has increased from 550 million to 757 million in the period from 2005 to 2015 (ITU/ICT Indicators Database, 2015). On the one hand, the number of users has increased drastically. On the other hand, the development of the telecommunications industry has provoked a number of public discussions about how and why it should be regulated, what are the advantages, disadvantages, impact of this industry and much more.

The telecommunications sector has been referred to as a natural monopoly within the political economy since its early development. The first definition originates, arguably, from the 19th century when the industry was heavily dependent on technology, giving the examples of supply of gas and water, railways, and telecommunications (Mill, 1848, Ely, 1894). In the beginning and middle of 20th century, the telecommunications industry was still perceived as a natural monopoly due to the industry's dependency on fixed costs when building the network thereby creating sustainable monopoly (Baumol, 1977, Stiglitz, 1997, Tirole and Laffont, 2000, Mosca, 2008). During this period, one organisation was managing the telecommunications services in every European country being either a public agency or a state-owned enterprise which "enjoyed state-sanctioned monopolies over virtually all aspects of telecommunications […] [and] regulatory powers" (Mayer-Schönberger and Strasser, 1999:573). Telecom liberalisation, also known as deregulation, took place in the 1980s which can be understood as a process having the "desire to free the telecom sector from undue burdens and stifling regulations" (Mayer-Schönberger and Strasser, 1999:564).

As a result of this deregulation in the markets, technological improvements and relatively low costs, analysts and academics argued that starting from the 1980s the telecommunications industry has transited from a natural monopoly to a liberalised market. Stiglitz (1999) stated that "these new technologies [recent advances in telecommunications] mean that there is no longer a

natural monopoly on communications, and by using competitive, market forces, access can be enhanced and prices lowered." Yet, the discussion of natural monopoly seems to be on-going as many pay attention to competition and monopoly, often confusing both terms and point out that as long as there are capitalist firms, markets are getting increasingly monopolised (Pitelis, 1991:55). Regardless of the theories across different disciplines, competition and monopoly, in fact, depend on the type of market structure where competition is a dynamic process (Pitelis, 1991, pp. 55-6). In a working paper the Directorate-General for Economic and Financial Affairs evaluated the industry as: "these [network] industries are intrinsically characterized by the co-existence of competitive and regulated segments with natural monopolies, sunk costs, and economies of scale due to the crucial role played by the underlying infrastructure" (2013:9).

The liberalisation has led to a cheaper and faster national and international communication which made it possible for market transactions, information sharing for governments, consumers and business across borders to take place (Jungmittag and Welfens, 2009). The telecommunications services and products have seen an incremental development since the 1980s – 1990s in the face of phone and smartphone evolution and cellular telecom networks (GSMA Intelligence, 2016). These developments and deregulation led also to a fragmented market due to the high number of mobile operators, distortive behaviours, high debt and need for consumer protection (MEMO 13/779, 2013). Network industries, such as the telecommunications, are seen in the last years as an immense phenomena, even regarded to as "fast-growing part of the world economy" requiring an understanding of economics of networks (Economides, 2008:469). The European Union's (EU) regulation has often been accused of being inadequate to respond to the fast changing industry. A number of discussions upon the importance of the EU's involvement, industry regulation and consumer protectionism are provoked. And, most importantly, should a balance be reached between accommodating the needs and demands by both the industry and consumers.

Along with the increased demand and rapid changes in the telecommunications, a question emerges: is the telecommunications efficient as a market? If no, how can the European Union make sure that consumers and other industry participants get the most out of the opportunities it offers?

Chapter 2.Methodology

After being introduced to the problem formulation, the following chapter explains the methodological considerations towards finding an objective answer. The ontology used in this paper is to explain the variable effects and relationship between them where the European Union's policies are the dependent variable and consumer and data protection is the independent. Since a variable is something that can be measured and changed (Stiglitz, 1997:19), it is assumed that EU policies can be the dependent variable. In order to evaluate the market's efficiency, the analysis of the current regulation is made followed by defining the market structure. It is essential to take a look at the problem of market efficiency from different angles with regard to reaching objectivity. It is also proven that "one variable cause the changes in the other variable" (Stiglitz, 1997:19) and as the regulation can necessarily cause changes in the telecommunications (and vice versa), a causal relationship might be observed.

The paper discusses therefore the policies within the telecommunications taking into consideration the theory of policy analysis and one theory of market structure using three criteria. These criteria serve as limitations and help to find the proper empirical data and logical evaluation of the EU policies. Together with them, the rest of type of data (such as qualitative and quantitative), collection, research design, delimitation and other methodological considerations are established here, in chapter 2. In chapter 3 the focus is on the theories and implementation. In chapter 4, the empirical data, theoretical analysis, and discussion are presented and chapter 5 summarises the findings and conclusions.

2.1 Theory

A theory is needed in order to give explanation of the current situation in the telecommunications, provide conceptual understanding of the industry and guide the selection of empirical data in chapter 4. Furthermore, theories give different lenses through which to view complicated problems with the help of collected data thereby building a framework in which an analysis is conducted (Reeves et al, 2008:613). Taking into consideration the problem that the telecommunication's industry is inefficient and asks what the EU can do to encourage its progress by building a bridge between the industry and consumers, two theories are chosen to seek an answer. On the one hand, policy analysis reveals the EU's actions towards regulating an industry as the telecommunications and evaluates policy outcomes. On the other hand, the theory of oligopoly seeks to explain the market structure and how firms behave. In order to elaborate on the choice of both theories, this

sub-chapter presents arguments upon why policy analysis is suitable in this research and several market structures in order to identify and understand why a market can be inefficient. In chapter 3 the theories are further explored.

In connection to the theory of policy analysis, it includes in itself "how policy is made, why, when and for whom", a description of a particular policy and a critique of a policy (Parsons, 1995:55). Since it covers such range of aspects, it is chosen to serve as one of the main theories. The starting point in this paper is the belief that the EU has the political responsibility to set qualities, virtues (such as reliability and trustworthiness) and build a system of legitimate governance (such as predictability, order and stability) (Tsakatika, 2008, pp. 33-54). Also, within the telecommunications, the European Commission (EC) is responsible for the general rules and deregulation of the industry (Laffont and Tirole, 2000:34). Moreover, if the telecommunications is not an efficient industry, the government (or the European Union in this case) has the economic role to redistribute income and correct market failures (Stiglitz, 1997). This can be done by taking an action such as providing incentives for the private sector to do something (such as tax or direct subsidies), mandating the private sector to do something, or a combination of these actions (Stiglitz, 1997:161-3).

In order to reach the final conclusion of the choice behind the theory of oligopoly, several market theories are shortly explained following the conditions and assumptions on which they are built. Further in this chapter the characteristics of the European telecommunications are listed in accordance to the theoretical assumptions with the purpose of defining what type of market the telecommunications is.

There are a number of theories in relation to competition, market structures and antitrust but the paper overlooks perfect and monopolistic competition, monopoly, imperfect competition, natural monopoly and oligopoly. In the first place, Arnold (2010, pp. 196-7) defines perfect competition as: there are many sellers and many buyers, none of which is large in relation to total sales or purchases; each firm produces and sells a homogeneous product; buyers and sellers have all relevant information about prices, product quality, sources of supply and so forth; firms have easy entry and exit.

In the second place, monopoly, being the opposite end of the market structure, is built on three assumptions: there is one seller; the single seller sells a product for which there are no close

substitutes; there are extremely high barriers to entry (Arnold, 2010:223). High barriers to entry can be legal barriers, economies of scale, exclusive ownership of a scarce resource, market strategies, government policies or lack of information (Stiglitz, 1997, Arnold, 2010). There is no competition in this market as a single firm supplies the entire market (Stiglitz, 1997:336).

Thirdly, monopolistic competition is defined as: there are many sellers and buyers; each firm in the industry produces and sells a slightly differentiated product, there is easy entry and exit (Arnold, 2010:246). Products or services offered here are similar therefore the degree of competition is greater but firms do not depend on each other's reactions (Stiglitz, 1997:337).

Furthermore, imperfect competition refers to a market where competition is not perfect but rather limited (Stiglitz, 1997). In this type of competition firms believe that lowering the prices can generate new sales (Stiglitz, 1997:346). The problem in this market structure is that products are often similar, if not perfect substituted which gives the implication that "individuals will choose whichever is cheapest" (Stiglitz, 1997:347).

In addition to the arguments mentioned in the introduction in relation to natural monopolies, Stiglitz (1997:350) elaborates that where there is a technology involved in producing a good, a market can end up with only one or very few companies creating natural monopolies. This is heavily defined by the average costs which are high and protection by knowledge and lesser chance of new market entrants (Stiglitz, 1997, pp. 351-2). Moreover, Fudenberg and Tirole (2001) claim that in a natural monopoly "one firm could cover costs while two could not" (p. 46).

Lastly but not least, oligopoly is a rather broad theory having the common assumptions that there are few sellers and many buyers, firms produce and sell either homogeneous or differentiated products, there are significant barriers to entry; examples of this type of market are: car manufacturing and aluminium (Arnold, 2010:251). The small number of firms operating in this type of market is interdependent as each rival worries about what the other does (Stiglitz, 1997:336).

By putting the policy analysis theory and a theory of market structure in practice, one can understand where the industry inefficiency is created. On the one side, it can be the industry and firms' behaviour and on the other side, it might be the regulation which is not compatible with the industry's needs. At the end, not only firms suffer from an inefficient market but also consumers and regulators. The overview of the different market structures is important as they affect the

market in a certain way and require specific regulation while the theory of policy analysis proposes how. The following sub-chapter reveals the characteristics of the telecommunications in relation to the market structures and gives argumentation upon why oligopoly seems to fit best with it.

2.1.1 Characteristics of the telecommunications market in the European Union

These basic characteristics are useful for understanding the market and defining the type of market. Also, this helps not only the theoretical understanding but it finds an answer to the question of how to manage a market which might not be efficient. Nonetheless, the purpose of this chapter is to clear the contradictions of whether or not the telecommunications is de facto a natural monopoly.

When defining a market, a good place to start is overlooking it through the prism of economics. Microeconomics, in particular, refers to an industry and a single market such as the telecommunications (Stiglitz, 1997, Arnoldt, 2010). After explaining the different types of market, market features are defined as followed: 1. number of sellers; 2. type of products (or services) and whether or not they supplement each other; 3. information about prices, product quality, sources of supply and others; 4. firms have easy entry and exit to the market.

In the first point, the number of mobile operators is taken into consideration as these are the main sellers within the telecommunications, which are estimated to be over 100 in the EU (Thomas, 2013, Bender and Raice, 2015) and sellers in the face of consumers estimated to over 700 million subscribers in 2015 (ITU/ICT Indicators Database, 2015). Even the products and services within this industry are similar, the recent development of digital services and the Internet challenges Europe´s telecom operators (Libenau et al, 2012). In relation to information about prices, product quality and sources of supply, technology gives the advantage of spreading and accessing information about what sellers offer online. Lastly but not least, easy entrance and exit define the barriers proposed to new entrants. The telecommunications is an industry which requires a considerable amount of fixed costs (Tirole and Laffont, 2000), also "it is hard to find a more controversial issue in industrial policy that concerning the terms on which entrants can gain access to an incumbent firm's network" (Armstrong stated in OECD, 2004:7).

According to these characteristics and assumptions given by the market structures in the previous sub-chapter, the question of how the telecommunications can be defined as a market is finally answered. It is not a perfect competition as entering or exiting this market is rather difficult

judging by the actions of mobile operators to merge (O'Brien, 2012) and also, the Commission's decisions not to approve these mergers (Fairless, 2015). Nonetheless, the demand for technology investment and fixed costs in this industry if a firm would like to enter a market act as barriers (Tirole and Laffont, 2000). The telecommunications does not comply with the theory of monopoly as there is more than one seller and products have substitutes. In relation to monopolistic competition, once again the easy entry and exit fail to comply with the situation within the EU telecoms. Imperfect competition refers to how firms and buyers behave and therefore a close examination of a specific case is required. Finally, it is important to mention that a requirement by the Commission is that mobile operators must offer low-cost products to the consumers (European Commission, 2016b).

In relation to the discussion upon whether or not the telecommunications is a natural monopoly since the very beginning of this paper, the telecommunications used to be defined as a natural monopoly due to the transmission of telephone messages over wires. However, with the invention of alternative technologies such as satellites, more firms compete to provide long-distance services (Stiglitz, 1997:353). According to the theoretical explanations of market structure, the telecommunications can be hardly defined as a natural monopoly, however, if taking a closer look into the core of the industry, particularly the network, a contradiction emerges: network monopolies and a network good in particular (Arnold, 2010:280). As the network connects telephones, computers via the Internet, banks and others, it is a good "whose value increases as the expected number of units sold increases" (Arnold, 2010:280) therefore the production and sales of a network can lead to a monopoly. Even though a lot of attention is put on regulating this industry and innovation, regulation such as antitrust policies examine how a network monopoly behaves rather than what it is (Arnold, 2010:280). In some cases, a network good becomes the industry's standard due to the high switching costs. Network monopolies then turn into a lock-in effect explained as: "the situation when a particular product or technology becomes the standard and is difficult or impossible to dislodge as the standard" (Arnold, 2010:280). As this project examines the industry participants in the number of mobile operators, the theory of natural monopoly cannot be applied.

Ultimately, even arguable, the telecommunications fits the descriptions and assumptions the oligopoly gives as to the number of sellers and buyers, products and high barriers to entry. It is claimed that the European telecoms experience low-cost entrants and shifting consumer habits in an Internet age. Additionally, a regulation which keeps the prices low where mobile operators across

several Member States (MS) such as the UK, France and Spain look for merging mobile carriers to combine infrastructures and have more to offer to consumers (Bender and Raice, 2015). Despite these arguments, the paper takes the theory of oligopoly as the most suitable option for defining the European telecoms market.

Assumingly that the telecommunications industry is an oligopoly, the EU regulators have to decide upon the regulation which encourages its growth. Despite the disadvantages the telecommunications brings such as mobile operators having distortive behaviours or high debt (MEMO 13/779, 2013), there are also advantages. After all, the telecommunications is known to be one of the fastest-growing part of the world economy (Economides, 2008:469). One way to discover this potential is by evaluating the link between regulation, industry and consumers. This can be done by analysing the effectiveness and efficiency of this industry and the ability to protect consumers. The need for consumer protection has emerged not only due to the demand created by the increased number of users but also by the lack of trust among EU consumers. 575 million subscribers in 2015 (ITU, 2015) represents a profitable group for mobile operators and a challenge for regulators. Only 15% of Europeans feel that they have complete control over the information they provide online and while 71% agree and accept that providing information online is an increasing part of modern life, six out of ten sat that they do not trust landline or mobile phone companies, internet service providers or online businesses (Eurobarometer, 2015, pp. 6-8). It is therefore important to analyse the current policies about consumer and data protection and how the industry is operating. The next sub-chapter reveals the criteria which help the analysis and empirical data collection.

2.2 Choice of Criteria

In order to answer the question of how the telecommunications industry's growth can be encouraged while the consumers are protected, one should seek explanation of certain phenomena. In relation to policy analysis, academics choose policy indicators as evaluating criteria. Among some of them are human resources and organisational development (proposed by Parsons, 1995) or effectiveness and efficiency (used by Verluis et al, 2011). Since the primary focus of the paper is within the industry, the second set of criteria are chosen to be examined together with the consumer and data protection as it is an emerging issue. In the interest of finding out whether or not there are

gaps and dysfunctions in the telecommunications, the paper examines the current regulation utilising the three criteria.

Policy evaluation reveals two dimensions:"how a policy may be measured against the goals it set out to attain, and the actual impact of the policy" (Parsons, 1995:545). In relation to this, effectiveness of certain output in a policy can be evaluated by what is the actual result versus the planned output (Versluis et al, 2011:222). It is therefore chosen that certain goals set by the European Commission are used to show the effectiveness of the policy. The EC adopted the Digital Agenda for Europe (DAE) in 2010 setting specific goals for a number of areas. As the Commission strands for the collective European interest, the evaluation report from 2015-2014 is used in this paper. It shows where are the gaps, what should be improved and thereby evaluating the efficiency of the EU regulatory framework for electronic communications (European Commission, SWD(2014) 249 final).

Efficiency in this sense is similar to effectiveness as it takes what is the actual result versus the planned output. The difference is that efficiency considers the costs and therefore efficiency is used to evaluate the economic side of the EU telecommunications. Presented here are financial data taken from sources such as the EC, statistical databases and other working groups' findings. The purpose is to give a broader and objective overview of the economic situation in the industry. Lack of economic efficiency could possibly lead to market failure resulting in high unemployment, lack of competition, missing markets, mishandling of externalities, public goods, information and knowledge (Stiglitz, 1997, pp.153-9).

Finally, the Commission claims (2015) that: "consumers need to know their rights and be protected from the unfair practices of the companies providing these services" which is achieved by consumer protection policy and directives. Furthermore, according to a study made by the Center for Strategic and International Studies (2014), the Internet economy generates between $2 trillion and $3 trillion per year from which 15-20% are extracted by cybercrime. The same study reveals that cybercrime costs the global economy more than $375 billion annually. In 2012 a legislative package was proposed by the Commission and on the 26th of April, 2016, in the course of writing of this paper, the General Data Protection Regulation (GDPR) was adopted and as considered relevant, it is used in the analysis part.

All in all, by selecting criteria the answer to the problem can be reached. Efficiency, effectiveness and consumer and data protection are believed to contribute to both the industry and consumers' progress. The next part reveals the parameters to the research.

2.3 Delimitation

There is need for setting up boundaries to the research. First of all, the primary focus is on the telecommunications or so-called telecom industry/sector. In some cases the Information, Communication and Technology (ICT) is mentioned due to the empirical data. A distinction between different telecommunications services such as voice telephone services, packet- or circuit-switched data transmission services, telegraph services, facsimile services, radio-based, for public or non-public use (WTO, 2016) is not made as it is not considered relevant. However, in some parts, the specific type of data or service is explained. The geographical area is limited within the European Union which is looked upon as a collective institution with the exception of cases where is a need to distinct the situation in different MS. Also, in some parts international markets are compared to the EU in order to strengthen the data validity and statements. In relation to the data collection, neither questionnaires nor interviews were made as they were not considered relevant as their scope is rather narrowed. On the contrary, statistical databases were used as they present a broader data collection. Case studies were also excluded as a way of researching as the industry efficiency. The chapter continues further with what has been chosen instead.

2.4 Type of Data and Collection

The type of data used throughout the paper is qualitative and quantitative as there is a need for the mix of both supported by primary, secondary and tertiary sources. Quantitative data shows the economic and statistical data helping the empirical data of economic effectiveness, for example. In order to achieve an objectivism, the paper takes a positivistic epistemological point of view with the purpose of presenting the empirical data as facts about the policies within the telecommunications. The paper seeks objectiveness therefore a number of sources have been used throughout the research. Among the used sources are official European regulation texts and papers, newspapers, working and expert group papers, statistical databases, political, economic, and technological and law journals. Moreover, the next sub-chapter (2.5) reveals how the gathered data is analysed.

2.5 Analysis

In chapter 4 the analysis is made through an incorporation of empirical data and theoretical considerations. The criteria are chosen to help navigate the analysis process because effectiveness, efficiency and consumer protection represent aspects necessary to answer the problem of an inefficient market. If they are assumed to be the variables, as they "can be measured and [it is something] that changes" (Stiglitz, 1997:19), it is interesting to see what the relationship between them is. In case that the variables "tend to change together in a predictable way" (Stiglitz, 1997:24), a correlation exists whereas in case one of the criteria, or variables, causes changes in the other ones, a causal relationship can be observed. This means that effectiveness in the industry might affect the efficiency while the consumer and data protection can affect the efficiency. The analysis seeks to explore this relationship but assumes that the three criteria must cooperate if an effective market should be achieved. Effectiveness has the purpose of showing how development objectives were achieved by evaluating the set of goals and actual achievements while efficiency takes into consideration the management of financial resources such as investments and revenues. Consumer and data protection represents how the industry participants are protected. The criteria have different purposes and table 1 illustrates this:

Criteria:	Purpose:
Effectiveness	What are the set targets and what is the actual outcome?
Efficiency	What is the economic situation of the industry?
Consumer and Data Protection	Why and how consumers are protected?

Table 1: Criteria and Purpose Explanation. Own creation.

Finally, the chapter includes a discussion part where additional topics are added. The next sub-chapter illustrates the research design.

2.6 Research Design

The research design summarises the methodological considerations up to this point. The paper starts with an introduction which leads to the methodological chapter. This includes the choice of theory, characteristics of the telecommunications, choice of criteria, delimitation, type of data and data collection, considerations for the analysis and research design. Chapter 3 is dedicated to the theories

of policy analysis and oligopoly. Chapter 4 is divided into three sub-chapters starting with the empirical data, theoretical analysis based on the gathered data and a short discussion. The empirical data is collected based on the three criteria with the solid purpose of getting a better overview of the market. Table 2 illustrates the paper design which is the guiding structure for reaching the final conclusion and answer to the problem of how an inefficient market can be turned into a benefit for firms and consumers.

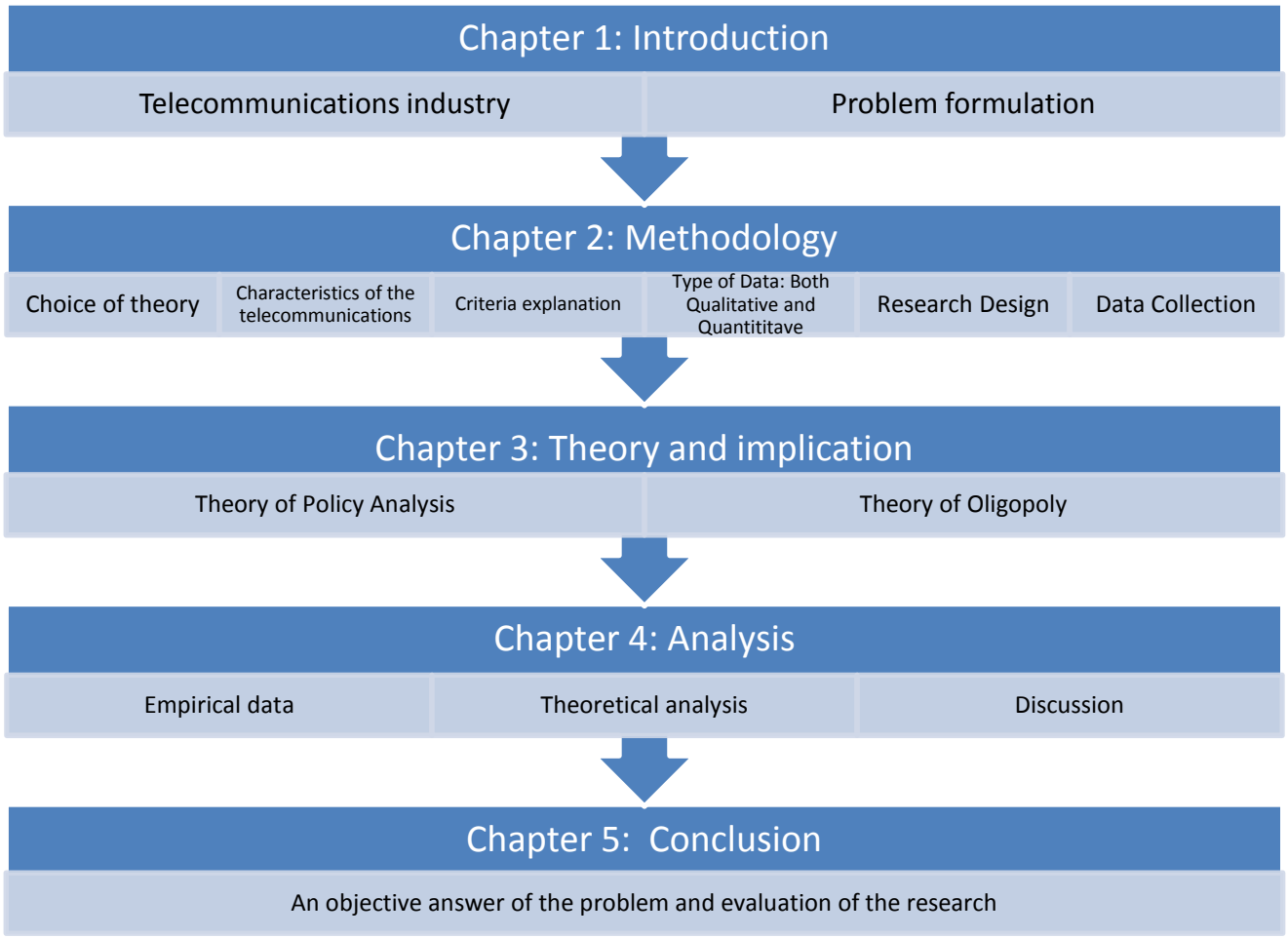

Table 2: Research Design. Own creation.

Once facts are gathered upon the achieved targets set by the Commission, economic situation and protection of consumers, theoretical considerations are incorporated in order to understand where the inefficiency lies – whether regulation is behind or the industry participants fail to comply with the set requirements. The discussion proposes topics for further consideration in relation to the telecommunication and regulation. Finally, chapter 5 summarises the findings.

To sum up, in chapter 2 the theoretical considerations and characteristics of the EU telecommunications market, leading to the choice of criteria, are presented. The delimitation defines the boundaries to the research supporting the type of data and the reason behind its collection. The analysis explains further how the empirical data is incorporated with the theories of policy analysis and oligopoly and the research design illustrates finally these explanations. In chapter 3, the theories are further explored before the analysis part which comes in chapter 4.

Chapter 3.Theory and Implication

The problem formulation represents a dilemma in the telecommunications regulation, therefore the paper seeks to understand the current situation. By doing so, an answer to how the EU can encourage the telecommunication's industry efficiency can be found. In order to do this, the theory of policy analysis focuses on the current regulation while the basics of the industry are explained going back to the microeconomic level to see how a market, such as the telecommunications, works. As a theory is: "an abstract representation of the real world designed with the intent to better understand the world" (Arnold, 2008:53), and in this case, market structures, the paper takes a closer look at the theory of oligopoly. On one hand, the theory of oligopoly shows the market in practice and on the other hand, the policy analysis shows the process behind regulating this market and how to analyse the policies. It is important that the relationship between the industry participants and the regulators is strong thereby creating a reliable and strong industry.

This chapter is divided into two sub-chapters where the first (3.1) presents the foundations of the theory of policy analysis and the second part (3.2) presents the theory of oligopoly. It is essential to present the values underlined within these theories in order to give a better understanding of the intention and activities of the different actors in this industry.

3.1 Policy Analysis

Policy analysis has become a part of the academic world together with the growing number of policies going back to the late 1960s (Parsons, 1995:27). A clarification should be made here as definitions as politics and policy are often confused. Cambridge Dictionaries (2016) explains *politics* as "power in action" defining how a country is governed and what activities does the government take while *policy* is "a plan of action or a set of rules agreed by a business, a political

group or a government". Parsons (1995:14) adds that "a policy is an attempt to define and structure a rational basis for action or inaction."

Furthermore, Parsons (1995) argues that among the number of common and overlapping concerns in policy analysis are: analysis of the relationship of public policies to 'problems', analysing the content of public policies, analysis of what decision-makers do and do not do and the consequences of policy in terms of output and outcomes (pp. 29-30). One of the frameworks and methods of studying public policy derived from these concerns is comparative public policy which is a mixture of social sciences such as politics, sociology, history and economy (Heidenheimer, 1985:460). It is considered a suitable theory as it studies "how, why, and what effect different governments pursue a particular course of action or inaction" (Heidenheimer et al, 1990:3 stated in Parsons, 1995:40). Since the problem formulation represents a socio-economic dilemma where the social aspect are the consumers and the economic is the inefficient telecommunications market.

Moreover, policy analysis includes "how policy is made, why, when and for whom", a description of a particular policy and a critique of a policy (Parsons, 1995:55). This is done by examining how policies have performed against policy goals and what impact a policy might have on a given problem (ibid). Often, the analysis focuses on different stages of the policy analysis such as policy process, different ideas, beliefs and assumptions about policy formulation, implementation, or evaluation.

The initial task when doing a policy analysis is understanding and clarification of the frameworks which form the analysis of policy problems, content and processes (Parsons, 1995:57). When referring to a system such as the European Union, a policy style model can be chosen as an approach to agenda analysis and policy formation as this explains "community" structures in which policy communities interact (Parsons, 1995:187). In this model, there are four dimensions where policy-makers:

1. Seek to attain consensus
2. React to problems
3. Seek to impose decisions
4. Anticipate problems

It is important to notice that the style in which policy communities and networks function differ over time and sectors where some issues require a wider policy community and others are dealt with without much consultation (ibid). When working with a policy, certain boundaries should

be defined such as economic, social, geographical, historical and cultural aspects (Parsons, 1995:207). This is the key to understanding how a regulatory body such as the European Union should take into consideration the industry actors such as industry efficiency and consumer protection.

When it comes to policy evaluation and assessment, the political affects and outcomes are considered as: "product of the political 'incomes': expectations, values, beliefs and culture" (Parsons, 1995:602). Although it is hard to reach an objective evaluation due to the contradictions and the role of the analyst, it is suggested that one factor is not enough to explain what kind of influence a policy has on outcomes. In addition to this, social and economic forces are argued to be the values within the policy process variables determining outputs and outcomes (Parsons, 1995:609). By balancing and analysing more aspects, a long-term understanding of the policies can be reached. In fact, greater social injustice, human freedom and dignity advancement can be reached by "more effectively and efficiently and with an understanding of forces which are shaping society" which can lead to saved lives, created jobs and increased life expectancy and quality of life (Parsons, 1995:610). This creates a broader picture which the theory of policy analysis undertakes.

The paper focuses on the outcomes of EU regulation, even though public policy is composed by a vast variety of topics. These topics range from different frameworks and stages, content and actions by decision-makers, among others. The reason behind the choice of this theory is that it gives a broader prospective of the socio-economic and political aspects which the problem represents. In addition to this, three criteria are chosen to help the collection of empirical data, namely effectiveness, efficiency and consumer and data protection. Together with these criteria, a deliberative policy analysis is chosen as it "extends the analytic goal beyond the technical efficiency of the governing institutions to include an assessment of the political interests and needs of the larger political community" (Fisher, 1998:140). It is critical to understand the community and policy idea(s) influencing the policy process and evaluation, in particular.

To summarise, the theory of policy analysis contains in itself a number of areas and activities connected to the building, implementing and evaluating processes of a policy. Because of the facts that it incorporates political and socio-economic aspects in terms of analysing the outcome of a policy, it is considered relevant towards finding out why an industry as the telecommunication

is inefficient. Next, the theory of oligopoly is focusing on the market structure in order to evaluate how and why firms behave.

3.2 Theory of Oligopoly

How a firm operates is worth studying and relevant as it shows the dynamic problems one company is experiencing in a market environment reacting to other firm's actions (Fudenberg and Tirole, 2001). It is also interesting to see how it reacts to regulations and how it protects consumers. What is more, a market structure defined by the particular environment of a company impacts the firm's pricing and output decisions (Arnold, 2010:196). Oligopoly as a word derives from monopoly having the meaning of a market structure in which each of few producers or sellers affects but does not control the market (Encyclopaedia Britannica). Oligopoly as a theory occurred around the 1920-1930s (Chamberlin, 1957). Furthermore, this theory of oligopoly is known to be one of the hardest to be analysed due to the market dynamics and uncertainties (Stiglitz, 1997).

In an oligopolistic competition, a firm has to decide what to do in order to gain profits – to collude with a rival or to compete against them (Stiglitz, 1997:380). A discussion upon the direct and indirect effects and interdependency has been provoked since its first development in the 1930s. Direct effect is explained as the seller's influence on the price and indirect effect are the actions of the rivals as a consequence of the direct effect (Chamberlin, 1957:216).

According to the present assumptions, oligopoly is based on: 1. there are few sellers and many buyers; 2. firms produce and sell either homogenous or differentiated products; 3. there are significant barriers to entry where a key characteristic is that firms are interdependent (Arnold, 2010:270). The small number of firms operating in this type of market is interdependent as each rival worries about what the other does (Stiglitz, 1997:336).

But there is more to this theory. Arnold (2010, pp. 251-7) argues that the cartel theory, kinked demand curve theory and the price leadership theories can be recognised as oligopoly theories. The cartel theory assumes that there is one firm which acts as a dominator thereby creating a number of problems such as forming cartels, difficulties in formulating policies, entering the industry and the problem of cheating (Arnold, 2010:270). Firms acting in such circumstances experience a generally inefficient outcome created by explicit and open agreement to collude (Stiglitz, 1997:380). Taking advantage of market power, observed in monopolistic markets, either

by colluding with one rival or by creating a group of companies can form a cartel. In 1776, Adam Smith wrote: "People of the same trade seldom meet together, even for merriment and diversion, but the conversation ends in a conspiracy against the public, or in some contrivance to raise prices. It is impossible indeed to prevent such meetings, by any law which either could be executed, or would be consistent with liberty and justice" (Wealth of Nations, 1776, book 1, chapter 10, part II). This can be referred to as an explanation to cartels (even at present times). Cartels can seriously affect prices within different industries and therefore antitrust laws prohibiting such behaviour are passed, however, some firms manage to create cooperative arrangements (Stiglitz, 1997:368).

The kinked demand curve theory is based on the assumption that if a single firm lowers the price, other firms will do the same. If, however, one firm raises the prices, others will not follow which eventually results in a gap in the marginal revenue and cost disturbance (Arnold, 2010:270). This theory has, however, met critics as evidence in empirical tests rejects the theory. The demand curve explains that an oligopolist loses a large amount of sales if it increases its price while rivals do not (Stiglitz, 1997:379). This leads to a marginal revenue curve with "vertical segment, which implies that the firm will often not change its level of output or its price in response to small changes in costs" (Stiglitz, 1997:381). This is similar to the price leadership theory which assumes that the market leader determines the prices which ought to be accepted by the other firms (Arnold, 2010:270).

Having these assumptions and problems, it is obvious that oligopolists have many considerations which cannot be estimated precisely as companies in such market might exploit the lack of information of their opponents or manipulate the information gaining benefits (Fudenberg and Tirole, 2001:61). It is observed that in a typical oligopolistic market with limited entry, even if there are new entrants such an industry remains dominated by a few firms (Stiglitz, 1997).

All in all, the theory of oligopoly provides an interesting explanation of the market structure. Although it is hard to be defined and analysed, the common features are that the number of sellers are few who provide a similar or homogenous product to many buyers and there are high barriers to enter the market. This type of market is characterised with an anti-competitive behaviour of sellers who are interdependent. The few sellers are involved in pricing strategic games where if one changes the prices, the rest follow. It is observed that in some situations, though, rivals collude in order to get the maximum benefits and define prices. Regulations and governments have been

attempting to control such behaviours by creating policies. Theory of policy analysis is therefore been presented as it proposes why the outcomes of the policies should be analysed, on the one hand. On the other hand, the theory of oligopoly shows the behaviour of sellers and firms who operate in a market such as the telecommunications. Later in chapter 4, the empirical data gives the market reality which is looked through the prisms of both theories with the purpose of estimating whether or not the telecommunications is an efficient industry. The actions of regulators are a critical step towards building an efficient industry. Also, if there are any gaps and loops in the regulation, firms can take advantage of it and misuse their market power.

Chapter 4.Analysis

The theoretical chapter is followed by the analysis part which is divided into three parts: empirical data (4.1), theoretical analysis (4.2) and discussion (4.3). In this chapter, data is gathered using the criteria stated in the Methodology chapter, namely: effectiveness, efficiency and consumer and data protection. Once the data is collected, the theories of policy analysis and oligopoly are used in order to give explanation of the phenomena occurring in the telecommunications. The final part including the discussion lays out topics for further consideration and research.

4.1 Empirical Data

This part starts by exploring the effectiveness of policy outcomes through analyses of goals set by the Commission in relation to building a Digital Single Market (DSM). The accomplished goals and failure to achieve these goals reveals the industry's efficiency and current situation. It is important to get an overview of the EU regulation's focus and policy's status.

The analysis continues with the economic effectiveness of the industry including a number of financial data within key indicators such as investments, growth and employment. This can be used as a link between the consumers and industry growth.

The third part of the empirical data is dedicated to consumer and data protection. Due to the fact that this is an emerging issue and the EU's responsibility to protect consumers, the new regulation adopted on the 27th April, 2016 is analysed further in this chapter.

4.1.1 Effectiveness

To start with, if a policy should be evaluated, a good start could be the revelation of two dimensions:"how a policy may be measured against the goals it set out to attain and the actual impact of the policy" (Parsons, 1995:545). In relation to this, effectiveness of certain output in a policy can be evaluated by what is the actual result versus the planned output (Versluis et al, 2011:222). It is therefore chosen that certain goals set by the European Commission are used to show the effectiveness of the policy.

The Commission adopted a strategy for the digital agenda in 2015 setting specific goals for a number of areas which in the long term aim at creating a DSM. The scoreboard for 2015 is used as it shows the current progress, gaps and what should be improved thereby evaluating the efficiency of the EU regulatory framework for electronic communications (European Commission, SWD(2014) 249 final).

Among the goals for building of a single digital market are: access, roaming, internet use, eCommerce (both consumers buying online and SMEs selling online), eGovernment and public research and development (R&D) for Information and Communication Technologies (ICT).

Even though there is progress in the broadband coverage and access in Europe, there is still a significant gap between urban and rural areas and an overall 70% difference between MS in 2014 (European Commission, Digital Agenda Scoreboard 2015:3). According to the scoreboard (ibid), the difference in the rural areas is even bigger where some areas (Bulgaria and Greece) have coverage of less than 10% and only Malta has 100% rural coverage.

In relation to roaming and communicating across borders, the efforts to bring down prices have started in 2007. Alongside the initiative of Connected Continent in 2013 which involves abolishment of charges, the prices have fallen and are expected to be completely removed in 2017 (European Commission, Press Release, 2015). In the agreement by EU regulators planned for 2017, consumers travelling temporarily within the EU will have no extra roaming fee except domestic price charges. The average price per minute has not really changed in the period from 2007 to 2014 ending up at around €0,10 cents (ibid). Meanwhile, the average roaming price per minute for made calls fell from €0,45 cents in 2007 to €0,15 cents in 2014 (European Commission, Press Release, 2015). There have been struggles to achieve the idea of roaming-free Union but some mobile

operators in the UK have used it as a strategy by creating special offers or even not charging in certain European countries (Gibbs, 2015). In the UK, alone, it is estimated that in 2014, extra mobile bills for travelling outside of the country cost £573 million (ibid).

Another target is daily internet usage has shown a more positive progress. The daily internet usage has reached almost 75% where Lithuania has around 90% and Romania has below 50% of regular internet users for 2014 (European Commission, Digital Agenda Scoreboard, 2015:5). Around 18% of the population in the Union has never used the Internet. On the contrary, the daily usage has increased among disadvantaged groups reaching 60%.

In relation to the increased Internet usage, online shopping has emerged. Online shopping has seen a progress in the last couple of years being used by 50% of EU consumers where 44% shop online nationally and only 15% shop online from another Member State (European Commission, Digital Agenda Scoreboard, 2015:6). Despite the positive outcome, the target of cross-border online shopping has not been reached as there is 5% deficiency. UK is the leading country with close to 80% of individuals shopping online while only 10% of Romanians shop online (European Commission, Digital Agenda Scoreboard, 2015:6).

Buyers and sellers have to be equally encouraged to take advantage of online shopping. In relation to Small and Medium-sized Enterprises (SMEs) which sell online, the gap between the set target of 33% and reality is significant as on EU28 average, below 15% of SMEs sell products online and 35% of large companies selling online (European Commission, Digital Agenda Scoreboard, 2015:7). According to Eurostat in 2015, 88% (previously estimated to 91% in 2012) of individuals bought goods from national sellers in comparison to 30% who used sellers from other EU countries and 18% bought online from sellers located outside of the EU. Mobile operators explain an incremental shift in mobile due to online development and what technologies can add to the mobile services giving the opportunities such as using smartphone applications, gaming, online tv and other services (Scott, 2015). A constrain in the case of SMEs and using online services seems to be the compliance costs with regulatory obligations within consumer protection and VAT. It is estimated that these costs tend to be higher than in other markets such as the US (Directorate General for Internal Policies, 2015). Once a solution to this is found, this can open the door to other services such as eGovernment, online selling and shopping which is connected to the set targets.

Governments have also seen the advantages of easing some procedures by providing online services. Just below 50% of individuals within the EU (EU28 indicator) in 2014 submitted online forms and used public electronic services (European Commission, Digital Agenda Scoreboard, 2015:8). This is a good achievement since the target for 2015 was 50%. However, once again the situation in the member states varies significantly where Denmark is leading with close to 90% of individuals using eGovernment and Romania on the far end with 10% and it is believed that previous factors such as access to the Internet affects this target (ibid).

In order to nurture this industry, it is important that public R&D (research and development) is supported. Around €6 million have been invested in public R&D in 2013 and the target set for 2020 is doubling this figure (European Commission, Digital Agenda Scoreboard, 2015:9).However, in such a long time span, one might ask if this amount is enough compared to the benefits that might emerge.

All in all, the achieved targets are regular usage of the Internet (including disadvantaged groups), online shopping, basic broadband, eGovernment completed forms and insufficient progress is seen in relation to SMEs selling online, cross-border eCommerce and roaming (European Commission, Digital Agenda Scoreboard, 2015:10). The targets, according to the scoreboard, which are too early to be discussed, are coverage and R&D. Despite the considerable improvement and certain achieved goals in 2014, there is still a need for progress and harmonisation between MS. These gaps can lead to lack of innovation, unemployment and missing on opportunities. Critical questions can be asked towards the set targets. If this is part of building a DSM, are these targets enough? What about education and stronger focus on public R&D? How can the EU telecommunications be encouraged on a global level competing on international markets? Before jumping to conclusions, the economic efficiency is evaluated.

4.1.2 Economic Efficiency

After the effectiveness is analysed, the following sub-chapter looks upon the economic efficiency of the telecommunications. If in a private market such as the telecommunications, the resources are used in a proper way, it can become a part of a well-functioning economy. Otherwise it can become a failing market. In this case high unemployment, lack of competition, innovation and knowledge, public goods or externalities (when markets supply too much of some goods and too little of others) are among some of the risks (Stiglitz, 1997, pp. 153-160). In order to get a better understanding and

see whether or not the telecommunications is failing, key indicators such as investment, revenue, growth and employment rates are included. Once data is collected, the industry's situation is revealed pointing out the positive results and gaps which can be eliminated by taking proper decisions and actions.

In recent years, a public discussion appeared upon the importance of technology and digitisation, often referred to as a digital economy. A short definition can be given as: "The digital economy is comprised of markets based on digital technologies that facilitate the trade of goods and services through e-commerce. The expansion of the digital sector has been a key driver of economic growth in recent years, and the shift towards a digital world has had effects on society that extend far beyond the digital technology context alone" (OECD, 2012:5). The importance of the benefits of the digital economy shape nearly all the sectors of the economy and social activities such as retail, transports, financial services, manufacturing, education, healthcare, media, among others (European Commission, Digit/008/2014). The potential of this digital economy is, however, not fully utilised in the EU, as the Commission (2016) claims. Once the potential is reached, it can contribute to innovation, growth and jobs, among other benefits.

In regards to investments, the European electronic communications sector received €42 billion in 2012 giving the increase of 1.4% since the previous year (European Commission, SWD(2014) 249 final:6). The total revenues decreased from €334, 7 billion in 2011 to €323, 6 billion (ibid). If this is broken down to member states, the telecom revenue growth for 2011-2012 is unstable. A difference from -15.1% in Latvia to 10.1% in Luxembourg can be observed where most countries experience a negative growth (European Commission, SWD(2014) 249 final). Public investments for the same period in the separate countries varied from -26.2% in Lithuania to 92.1% in Ireland (ibid). The mobile revenue in the EU, alone, has fluctuated in the period of 2005-2015 estimated to €140 billion in 2012, most likely continuing to decrease (European Commission, SWD(2014) 249 final:9). Despite the decline in the industry, some predict a positive growth in the telecommunications in 2016 (Fioretti, 2014).

Despite the negative growth, the telecommunications enterprises created jobs for about one million people in 2012 giving the value of €165.0 thousand per person in the EU28 and cost estimated to €53.8 thousand per person (Eurostat, 2015). It is important to mention that the situation in member states differ in the amount of wages, where the wage-adjusted labour productivity ration

(defined as value added divided by average personnel costs) reached over 400% in countries such as Poland, Luxembourg, Portugal and the Netherlands and the lowest of 200% was observed in Austria in 2012 (ibid). Another report by Eurostat (2016) shows that in 2016 more than 21 million men and women in the EU28 are unemployed, a remaining issue since 2000 when above 20 million people did not have jobs (accounting to 9.2% of the labour force). This proposes that remuneration in this industry may vary among MS.

Another issue seems to be the lack of the investments by mobile operators. The total capital expenditure of the telecommunications sector has reached €47 billion in 2014 which has increased by only 1% since the previous year (ETNO, 2015:18). Public investments per capita in EU-15 the telecommunications is the lowest estimated to €111 thousand for the period 2005 - 2009 in comparison to Australia and Canada investing respectively €226 thousand and €181 thousand (Grijpink et al, 2012:5). In addition to the low investments, operator's revenues per mobile subscriber has fallen to €22 per month in 2011 declining by -8% per year (Grijpink et al, 2012:6). In 2015, mobile operators' revenues fell to €248 billion, showing a decline of 11% from 2009 to 2015 (Bender and Raice, 2015). Investment in innovation is known to benefit the economy as a whole (Stiglitz, 1997:459). Lack of innovation, especially in Europe, is consequently known to be a major contributor to economic problems (Nixon, 2015). It is therefore important that investments are encouraged within the telecommunications.

Despite the potential, public investments and job creations, the telecommunications seems to be experiencing a negative growth. The situation between member states differs often leading to a decline in the industry. The decreasing revenues lead to lack of investments by the mobile operators. Firstly, effectiveness is evaluated pointing out gaps in the market. Secondly, economic efficiency revealed financial issues. The final part of the empirical data – the consumer and data protection – and its analysis is presented in the next sub-chapter.

4.1.3 Consumer and Data Protection

The next sub-chapter focuses on consumer and data protection as the final criteria for evaluation of the telecommunications industry. The EU has the responsibility of protecting its consumers in a number of areas and the consumer policy "aims to maximise consumer participation and trust in the market" (European Commission, 2016a). On top of creating policies within product safety, internal market, trade, competition, financial services, transport, telecommunications, energy, the

Commission has the sole responsibility of guarding and integrating these policies with the consumers' interests (ibid). Among some of the Commission's initiatives and frameworks are: high quality and safe products, rights protection, prevention of dominant position and cartels formation (European Commission, 2012, COM(2012) 225 final).

It is worrying that there is lack of trust when being online. According to Eurobarometer (2015), 15% of Europeans feel safe when providing information online, 70% fear that companies collecting information use it for other purposes than the one initially stated and 90% believe that it is important to have the same rights and protection in all member states. Reforming and shaping the data protection has been on-going since 1995 when a directive was adopted, updated in 2008 and a legislative package was ultimately proposed by the Commission in 2012 including a general data protection regulation and a directive on protecting personal data processed for the purpose of law enforcement (European Council and the Council of the Union, 2016). Article 8 in the Charter of Fundamental Rights of the EU (Official Journal of the European Communities, (2000/C 364/01), p. 10) and Article 16 on the Functioning of the European Union (Official Journal of the European Union, 2012/C 326:55) state that personal data protection is a fundamental right. Alongside the opportunities which are brought by publicly available electronic communications services, risks for personal data and privacy storage and processing have emerged (Moussis, 2011). The protection of privacy directive setting specific rules for the telecommunications sector (Directive 2002/58/EC) in regards to harmonisation of the provisions, rights to privacy and free movement of such data within the Member states (Moussis, 2011).

On the first reading on data protection reform in April 2016, the Council adopted its first position which defined the adoption of the legislative package by the European Parliament (European Council and the Council of the Union, Press release, 2016). After the formal adoption of the proposal by the Council of the European Union, European Parliament, the Council of the European Union, the Civil Liberties, Justice and Home Affairs Committee, the European Parliament received the text for second reading and finally the GDPR was adopted (Berry, 2016). The GDPR will enter into force 20 days from its publication starting from 24th May, 2016 and it will be fully applicable after a two years grace period (ibid).

The general protection regulation has the purpose of highlighting the data protection level of individuals, its processing and the growing business opportunities which the DSM has to offer

(European Council and the Council of the Union, Press release, 2016). In a nutshell, the principles and rules on processing personal data of individuals are strengthened. Individuals whose personal data is being processed have more control over their personal data (ibid). The GDPR allows European users to have easier access and better information about what happens to shared personal data once given to a third party and gives the option to erase personal data (in case this is a child). Among other subjects GDPR focuses on is the requirement of parental consent if a youngster below the age of 16 should use online services.

In order to help businesses benefit from the opportunities in the DSM, the regulation establishes a set of rules for both European and non-European companies offering services online in the EU in order to avoid conflict of national data protection rules and cross-border exchange of data and promote fair competition to enterprises (Council of the EU, Press release, 2016). According to the press release (ibid), one of the solutions to cost and administrative reduction, in case a company is operating across borders, a company is allowed to deal with only the data protection authority in the member state of its main establishment. Different activities and risks require different solutions and set of obligations to a company and therefore the regulation maintains its right to changes. There is a possibility of facing a fine of up to €20 million or 4% of the global annual turnover of the ones who do not comply with the new data protection rules (ibid).

The new regulation puts an emphasis on the field of law enforcement stating that "[…], to the activities of courts and other judicial authorities, Union or Member State law could specify the processing operations and processing procedures in relation to the processing of personal data by courts and other judicial authorities" meaning that compliance with the rules of this Regulation should be ensured when operating with data processing (Regulation (EU) 2016/679(20)). Punishment such as penalties can be applied in relation to public security, the prevention, investigation, detection or prosecution of criminal offences such as money laundering or in order to help the activities of forensic laboratories (ibid).

All in all, the GDPR focuses on individuals and businesses. Personal data protects especially children and youngsters below the age of 16. Businesses which offer online services can face fees if they do not comply with data protection rules. Even though it is hard to evaluate the outcome of this regulation as it has still not come into force, it is importance to mention the lack of protection of financial reporting, cybercrime, national security, privacy policies at working places as some

privacy trends propose (Leizerov et al, 2016). After identifying gaps in the EU efficiency and economic effectiveness, the GDPR's aims were presented. The empirical data collected in this chapter based on three criteria is used together with the theoretical frameworks proposed by the policy analysis and the theory of oligopoly.

4.2 Theoretical Analysis

In this theoretical analysis the collected data is looked through the prisms of the policy analysis theory (4.2.1) and the theory of oligopoly (4.2.2). This leads to the final part of the analysis – the discussion part (4.2.3).

4.2.1 Policy Analysis

The collected data based on the criteria of effectiveness, efficiency and consumer and data protection is intertwined with the assumptions lying in the foundations of the theory of policy analysis. In contrast to the theory of oligopoly, the policy analysis looks upon the decision-making process behind the regulation and the policy outcomes. The theory represents the policy process from problem definition to policy implementation and evaluation. In addition to this, the policy style model can also be considered which is composed of four dimensions: seeking a consensus, reacting to problems, seeking to impose decisions and anticipating problems. Nonetheless, the outcome of this long process is considered in relation to the set targets, financial situation and data regulation.

As a consequence, in the first case of effectiveness and the set agenda by the Commission in 2010 part of the DAE, a question of why specifically these issues are on the agenda is provoked. Moreover, what happens to targets which are not reached? How can these targets be prioritised? What about other areas outside of coverage, roaming prices, Internet usage, eCommerce, eGovernment and R&D?

The equally significant aspect of efficiency can be provoking the theory of policy analysis where the data from investments, revenues and employment within the telecommunications are not satisfying. In this case when investments and revenues are declining and employment is considerably high, the first stage of policy analysis is reached as to identifying problems. At the next level questions upon the reaction, seeking a consensus and imposing decisions emerge as of

what can be done in order to help industry participants to invest more thereby creating more jobs which can later create high revenues?

In relation to the third criteria of consumer and data protection where the process behind this regulation is explained in more details, the policy analysis theory can overlook also the process behind its adoption. Judging by the time span in which efforts have been directed towards shaping the data protection going back to 1995, the updated legislative packages in 2008 and 2012, it can be concluded that the time for adopting a general data protection regulation has finally come. Furthermore, by consulting and requiring positions of the EU institutions such as the Council of the European Union, European Parliament, different judicial councils, a consensus and objectivity can be reached together with seeking to impose decisions and anticipate problems such as privacy and data protection. Finally, this is a significant difference in the regulation as this is the first regulation within this area since its first attempts to regulate in 1995.

To conclude, the theory of policy analysis is mostly critical towards the final outcomes of the effectiveness and efficiency. In the case of consumer and data policy, however, as the GDPR reveals more behind the decision-making, the theory can elaborate more on the regulation and give a better explanation. In the cases with effectiveness and efficiency, a number of questions are raised putting the industry's regulation and decision-making in doubt. As the theory overlooks the results and outcome of a policy, an in-depth analysis can be made once the regulation is implemented.

The next sub-chapter analyses the empirical data through the lenses of the theory of oligopoly.

4.2.2 Theory of Oligopoly

If the policy analysis focuses on the outcome and process behind the policies, the theory of oligopoly focuses mainly on the firm's actions. To begin with, the targets set by the Commission in 2015 are linked to the assumptions which the theory of oligopoly brings in order to see whether or not the theoretical part is applicable to the first criteria. As listed in the beginning of this chapter, the set targets were: better access and coverage, roaming at reasonable prices (if no charges), internet use by more groups of people, eCommerce (both encouraging consumerss to buy online

and SMEs to sell online), eGovernment (where public services are digitised) and more investments in public research and development (R&D).

Firstly, the lack of access in rural places in many areas of the EU can create a problem not only for people who need coverage and mobile services but also for mobile operators who would like to invest and deliver services. This can affect investments, act as an entry barrier and define the number of sellers, or mobile operators in this case.

Secondly, in relation to roaming prices, since the first efforts to bring down prices, there are significant results ensuring of no extra roaming fee when travelling. By negotiating the prices, the EU acts as the price regulator which disproves the theory of the telecommunications being an oligopoly.

Thirdly, the internet usage is closely linked to using public services on the Internet, shopping and selling online, also referred to as eGovernment and eCommerce. Although it can be argued that this is not directly applicable to the theory of market structure and the traditional offered services by mobile operators, it is of worth mentioning that most mobile operators offer Internet in addition to the ordinary phone and message services which allows people to make use of online public services, shop and sell online using their smart phones. It is therefore interesting to see how this can affect the activities and behaviour of mobile operators. R&D is especially important as within this area of technology development and mobile operations, research and development activities are shared. As for the target set for 2020 to be €12 million, investment from mobile operators can encourage and create mutual interest of building a stronger and better telecommunications industry.

In relation to the second criteria – effectiveness – the data gathered from investments, revenues and employment guides the theoretical assumptions. Taking as a starting point the decreasing level of public and investments by mobile operators, the significant difference in MS and declining revenues, it can be concluded that the industry is not effective. The only case where the telecommunications seems to show a positive result seems to be the job creation when in 2012 one million jobs were created within the telecommunications.

Overlooked through the prisms of oligopoly where there are few sellers and many buyers in such a financial situation, it would be hard for firms to gain profits. Buyers who do not have jobs

could probably not spend much on this telecommunications services. Also as there are similar products and services in this industry, there is a high possibility that buyers would choose the cheapest option which is not going to help mobile operators to gain sufficient funds and further invest. Lack of investments is closely linked to innovation and therefore the buyers could suffer. Nonetheless, a market which is ineffective acts as a burden to new entrants or a barrier to entry therefore it might allow current firms operating on the market to dominate. In the last place, 21 million people without jobs within the EU could be useful for mobile operators who can create jobs and see the potential in this group.

Finally, the assumptions, on which the theory of oligopoly is based on, look upon the data and consumer protection regulation (GDPR). In short, the GDPR focuses on protection of individuals and encouraging businesses to explore the opportunities the digital market has to offer. The control over personal information provided and used by third parties is outlined, especially for kids and youngsters below the age of 16. For firms offering services online both within the borders of the Union and outside, the regulation aims at easing the process of complying with rules only with one local data protection authority where the main establishment of the company is in order to reduce costs and administrative burdens. In case a company does not comply with the rules, it can face up a fine of up to €20 million.

Certainly, there is no shortage of disagreement within the assumptions of few sellers and many buyers, products and services, barriers to entry brought by the theory of oligopoly. It is arguable that it might be hard for mobile operators not to make use of personal information or release how and what type of information is reused. This regulation can ultimately affect the type of product or services by setting requirements. Also, strict regulation might be perceived as entry barriers for firms, even though the regulation is designed to be practical, it might create problems for companies operating in different countries.

To sum up, the empirical data supports the assumptions of the theory of oligopoly to some point. In the first place where efficiency is evaluated, the set targets can be used as entry barriers and therefore encourage the small amount of sellers or mobile operators. On the contrary, in relation to roaming prices, the EU acts as price regulator disproving the theory. Despite the gaps in the targets, there is shown progress in most targets. It can also be assumed that mobile operators play an important role in promoting and nurturing activities related to these targets such as investing in

R&D. Furthermore, in connection to the market's effectiveness - the poor financial situation pointed out by decreasing investments, revenues and low employment rate can act as burdens to new-coming firms thereby encouraging firms already operating to control the market activities and its growth. The final part of the empirical data – consumer and data protection regulation – contradicts the assumptions behind of the theory of oligopoly. As the results from this regulation cannot be predicted at this point, it is interesting to see how firms will react to it.

Each of these theoretical considerations makes an important contribution to understanding of the efficiency in the telecommunications industry. On the one hand, the empirical data helps the theory of policy analysis by giving a better understanding of the criteria (for example the case of GDPR). On the other hand, the empirical data reveals gaps in complying with the theory of oligopoly where the EU stands up to companies setting up demands and requirements (once again in the GDPR). It can be concluded that the efficiency and effectiveness are strongly criticised as not showing positive or realistic results whereas the general data and protection regulation is supported by both data and the theory of policy analysis. Although it might not be supported by the theory of oligopoly, GDPR gives a good example of political, economic and social consideration where consumers' privacy and business encouragement are in the centre but fines are not excluded. The outcome of this regulation is yet to be seen and evaluated, though. Oligopoly has the assumptions that there are few sellers and many buyers in an industry, firms produce and sell either homogenous or differentiated products, there are significant barriers to entry and firms use pricing strategies or opportunities to collude by forming a cartel.

On one hand, the theoretical framework gives an explanation to the telecommunication. On the other hand, the empirical data reveals the industry's status. The empirical data, which is based on three criteria, points out the efficiency, effectiveness and consumer data protection within this industry. If the theories and the empirical data represent both sides of a coin, this helps reaching an objective conclusion to the problem of the industry's status. It is also relevant to mention topics for further research. This is done in the Discussion part.

4.3 Discussion

Verbal communication is a feature separating humans from other species and an essential part of everyday life. Telecommunication is therefore a sector which has been flourishing ever since its early development. But how it all started? It had its ups and downs and it certainly was not a one-

day event but a long process. The final part of the Analysis chapter is dedicated to discussing possible topics for further research.

Electromagnetism plays an important role to the telecommunications as it is known nowadays with the discovery of an electrical current passing through a wire deflected a nearby compass needle by Hans Christian Oerested in 1819 (Hochfelder, 2010:29). Names such as Michael Faraday, Joseph Henry, Alfred Vail and Samuel Morse, among others, laid the foundations for electrical communications and power's later development (Hochfelder, 2010). Their efforts led to the invention of the first commercial telegraph in 1845 in the US (Hochfelder, 2010:31). Few decades later, in 1876, the telephone was invented by Alexander Graham Bell who protected it with two patents in the same year (Gorman and Robinson, 1998) allowing the wave of developments, products and services within the telecommunications sector in the years to come. The involvement of public authorities has played a crucial role by funding, patenting and later regulating these inventions and the sectors they are a part of. One of the first international conventions concerning service regulations and tariffs was held in 1885 in Berlin (ITU, 2016).

The development of the telephone created a demand for technological products and services, among which is the introduction of mobile telephony. In Europe, Sweden is among the first-movers to bring mobile telephony development to the continent with an automatic system in service in 1956 (Dunnewijk and Hulten, 2007:166). Mobile telecommunication technologies' first generation (1G) started in the 1950s developing to the second generation (2G) or GSM technology being succeeded by the third generation (3G) technologies being responsible for the integration of telecommunication services and multimedia services (Dunnewijk and Hulten, 2007). Together with the progress of these technologies, standardisation took place by national telecommunication authorities such as creating working groups deciding on how to satisfy the growing demand (Dunnewijk and Hulten, 2007:166). Similar to the development of the telephone, the standardisation of the advanced telecommunications services took more than a decade to develop and by 1980s many competing mobile telephone standards existed varying from place to place from European countries through Saudi Arabia to Japan (Dunnewijk and Hulten, 2007:166).

Several centuries later, the situation in the telecommunications is completely different, not only in product and service offerings but also in terms of regulation. Being part of the ICT industry, the telecommunications can take advantages of the opportunities it represents. Together with the

technological improvements, the mobile industry has seen a number of improvements and transformed into one of the fastest-growing part of the world economy (Economides, 2008:469). With such an incremental progress in about two centuries in mobile devices and policies, it is hard to see how the industry can change in the next two decades, even in the next two years. Some analysts make attempts to define the upcoming opportunities. The focus on mobile devices and broadband connectivity is explicit due to the growing trends such as video streaming, Internet of Things (IoT), and mobile payments (Sallomi, 2016). Other trends such as big data analytics, cloud-computing and Artificial Intelligence (AI) create the need for standardisation (ibid). The way information is relayed across networks (also known as Internet Protocol or IP) is related to cloud storage (Wynn, 2016). Cloud is a third-party which store and process of data off-site in secure centres or 'data centres' (ibid).

Among some other key factors in the telecommunications are mobile applications. The number of mobile application's downloads have increased from over 63 billion to over 100 billion, where the number for 2017 is predicted to reach over 268 billion (Rivera and Van der Meulen, 2013). All these factors and trends represent opportunities for investments and innovation which the EU telecommunications needs. Together with these opportunities come challenges and threats.

Some companies took advantage of the new industry thereby establishing national and international firms such as Ericsson (Dunnewijk and Hulten, 2007:166). Companies such as Windows and Google are known to have significant economic and political power, often, being accused of market dominance (Reich, 2015). How these companies can be controlled despite their influence and economic power? Furthermore, the European telecommunications is often compared to the US and Chinese markets where the EU is accused of the high cost rates, high number of mobile operators and lack of innovation. The high number of mobile operators brings set of regulatory characteristics and licensing regimes which brings inefficient economic consequences (Fengler, 2015). While 40% of the US takes advantage of 4G connections, only 10% of mobile connections enjoy it in the EU (ibid).

In connection to consumer protection, technology in the telecommunications carries personal information, expectations about privacy programs are becoming a demand by governments and individuals especially data collection, usage, share, maintenance, controlling access and

assuring a balance between monitoring for insider threats and employee privacy (Leizerov et al, 2016).

The threat, which might substitute for traditional telecommunication and audio-visual services such as voice telephony, SMS and television, comes from over-the-top (OTT) services (Directorate General for Internal Policies, 2015). Since online content, applications and services are becoming an inseparable part of commerce and society, the need for looking beyond traditional industries is growing (ibid).

Finally, in connection to DSM, some critics point out the EU does not seek the outcomes but rather focuses on the policy processes which take too long for such a dynamic industry (Directorate General for Internal Policies, 2015). It is also argued that focus should be paid on online services and the IoT (ibid).

Along with the opportunities the telecommunications brings, come the risks and threats. The industry has reached new perspectives since the Bell's invention in 1876. Nowadays, the phone has a range of features such as transferring money over the phone, saving data on cloud centres and much more. The Internet is claimed to generate of up to $3 trillion, yet $375 billion are spent on cybercrime in 2014. The new application and technological trends create the demand for regulation, especially in the EU when the market is lacking behind international competitors. Furthermore, traditional mobile services are threatened by the evolution of OTT services. What can the EU do to encourage the industry's efficiency? Are current regulation policies effective? How can a DSM be built then? Maybe the EU should be swifter in responding to the industry's growth? Or maybe there should be one major European operator covering the demands and facing the challenges? Would that bring back the discussion of a natural monopoly? Who knows?

All in all, the empirical data presents a wide range of facts, numbers and topics which are relevant when talking about the efficiency of the telecommunications market. The goals set by the Commission in the DAE are not completely reached and a significant difference between MS can be observed. While the economic efficiency seems to struggle, the actions towards the adoption of GDPR provoke positive reactions. The theories of policy analysis and oligopoly are, however, mostly critical over the market. The discussion of threats and opportunities lying behind this industry is gripping. All this leads to the final chapter of conclusion.

Chapter 5.Conclusion

This final chapter summarises the findings of this paper and gives an answer on whether or not the telecommunications is efficient as a market. In case it is inefficient, the paper asks how the European Union can ensure that consumers and firms benefit from the opportunities this market has to offer.

The way to reaching the conclusions, that the telecommunications is, in fact, not efficient as a market and regulation should encourage the growth and improvement, has been paved by the methodological considerations of data collection, theoretical explanations and analysis. To begin with, the ontology explained the variable effects and relationship between the EU's policies as the dependent variable and consumer and data protection as the independent. As the problem represents a predicament of building a bridge between consumers, firms and regulation, three criteria have been chosen: efficiency, effectiveness and consumer and data protection. The assertion, that efficiency and effectiveness are useful for policy evaluation, is underpinned by Parsons (1996). Furthermore, consumer and data protection is provoked by the increasing demand of data protection in the recent years and the fact that the EU must guard consumer's interests.

The theories used in the research are policy analysis and theory of oligopoly. The theory of policy analysis is the most suitable match as the answer to the problem statement lies in regulation. The theory of policy analysis seeks an answer to why, how, when and for whom a policy is made and therefore it is a useful tool for analysing the telecommunications policies. Moreover, the assumptions which the theory of oligopoly proposes serve as solid explanation to the industry and its characteristics. Firstly, the number of sellers (mobile operators in this case) and number of buyers is high on European level. Secondly, the products and services are similar. Thirdly, there are high barriers to entry leading to 3 to 4 mobile operators in a European member state.

Analysed through the prisms of the theory of policy analysis, effectiveness and efficiency are criticised due to the final outcomes and, sometimes, poor results. Policy analysis supports, however, the GDPR as the regulation complies with many of the issues which are observed in the industry. A more in-depth analysis can be made once the regulation is implemented together with an outcome evaluation. Last but not least, the theory of oligopoly focuses mainly on firm's behaviour. The gaps in policy's effectiveness and efficiency can be burdens for firms and their contribution to the European economy. It can also lead to poor services which consumers can experience. Finally,

the GDPR can both be a stimulator and a burden for companies as it sets rules for data processing and fines. The empirical data overall supports the theory of oligopoly except that the EU sets the prices which contradicts the theory of price regulator.

In regards to the empirical data, effectiveness, efficiency and consumer and data protection are the criteria which have different purpose in the analysis. Effectiveness has the purpose of revealing what are the set targets on the regulators' agenda and what is the actual outcome while efficiency aims at revealing the economic situation of the industry including financial data. Lastly, the consumer and data protection intends to find out why and how consumers should be protected.

To start with, effectiveness looks upon "how a policy may be measured against the goals it set out to attain and the impact of the policy" (Parsons, 1995:545) therefore the targets adopted in the strategy for DAE are examined. Among the targets for building a Single Digital Market are access, roaming, internet usage, eCommerce, eGovernment and R&D. Overall, even the targets are achieved, in some cases, a significant difference in MS can be observed. Access or coverage in rural areas is still a struggle in some parts of the Union. To the contrary, the high prices for roaming have fallen according to an agreement between EU regulators and are expected to be completely removed in 2017. Furthermore, only 18% of the population in the Union has never used the Internet. In relation to eCommerce which includes both those who shop online and SMEs which sell online, it turns out that consumers shop primary from companies situated in the same country rather than another MS. High costs and underdeveloped technological infrastructures act as constrains to SMEs, though therefore more should be done in this area. Moreover, eGovernment gives the opportunity to governments to ease public procedures and services by providing them online where some countries are far behind in this initiative such as Romania. Finally, public R&D comes as the last target of giving the argument that the sum invested in 2013 should be doubled in 2020 which raises the question of whether or not this is enough.

In regards to the second criterion – efficiency – the economic situation in the EU telecom is not favourable. A slight investment increase of 1.4% was observed in 2013, however, revenues decreased for some MS with -15% whereas some saw an increase of 10% in 2011-2012.The firms in the industry created 1 million jobs in 2012 which has a positive impact but the problem of 21 million unemployed remains an issue. Furthermore, mobile operators fail to invest giving an only 1% increase in 2014 of total capital expenditure estimated to €47 billion. Revenues fall showing an

11% of decline from 2009 to 2015. The lack of solid economic situation can provoke a market failure and the lack of investment can prevent job creations.

Finally, the new GDPR was adopted in April 2016 which highlighted data protection of individuals and its processing, business opportunities connected to this area and fight cybercrime. Individuals have the rights to control their personal data; children and youngsters below the age of 16 are specially protected. This is done by giving the ability to erase data and for parents to give their consent before a youngster uses online services. Businesses, which do not comply with the requirements set by this regulation, can face fines for up to €20 million. The regulation offers cost and administrative reduction in order to encourage SMEs.

All in all, the empirical data and the theoretical assumptions suppose that the telecommunications market is not efficient. This leads to gaps in regulations and issues which must be faced. If a bridge should be built between consumers and industry, solid EU regulation must be in place. This is essential due to the reasons that the telecommunications is an industry which brings opportunities and threats.

Chapter 6.Bibliography

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