Alma Mater Studiorum – Università di Bologna
in collaborazione con LAST-JD Consortium
Università degli studi di Torino
Universitat Autonoma de Barcelona
Mykolas Romeris University
Tilburg University

DOTTORATO DI RICERCA IN

Erasmus Mundus Joint International Doctoral Degree in Law, Science and Technology

Ciclo 30 – A.Y. 2014/2015

Settore Concorsuale di afferenza: 12H3

Settore Scientifico disciplinare: IUS20

TITOLO TESI

The Competitive Order for the New Economy: Lessons from the Telecommunications Experience

Presentata da: DMITRII TRUBNIKOV

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Esame finale anno 2018

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Year 2018

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CHAPTER 1

INTRODUCTION

"I would stand for a free economic order even if it implied material sacrifice and if socialism gave the certain prospect of material increase."
Wilhelm Röpke (1959), The Economic Necessity of Freedom.

Sometimes ideas of "pro-" and "against-" free market pundits are so close to each other and so contrasted to their proclaimed foundations that they even might be confused.[1] Rothbard (2006), for example, points out that "[socialism] tried to achieve the liberal goals of freedom, peace, and industrial harmony and growth", and that many libertarian "positions are now considered "leftist" on the contemporary ideological scale". Moreover, those views that are treated by some economists as "democratic socialism" (see, e.g., Block and Barnett 2005), in fact, have been attempts to contribute to "a positive program for laissez-faire" (Simons 1934). At the same time, those who consider themselves liberal scholars, support established monopolies and claim that markets are self-correcting,[2] very often do not even admit that the market provides enough incentives for creative minds and support government actions in this area (see, e.g., Landes and Posner 2003).

[1] It is also interesting to note that modern studies notice similarities in conclusions of scholars from the opposite camps (see e.g. Holcombe 2015). In this sense, on the both extremes of the political economy spectrum there are claims that "the growing privilege of the 1 percent is not due to market forces but to the political power of those at the top" (Holcombe 2015. See also Stiglitz 2015).

[2] E.g. Posner (1968) argues that "public utility regulation is probably not a useful exertion of governmental powers; … and that even in markets where efficiency dictates monopoly we might do better to allow natural economic forces to determine business conduct".

It might seems very contradictory if a political economy outlook is "almost as harmonious with socialism as with private-enterprise capitalism,"[3] but this inconsistency can be explained by the fact that performance of an economic system heavily depends on institutional environment where this system is functioning, and there are infinite ways to design this environment. Outcomes of the market economy might be totally different and might be expressed in highly concentrated markets, high prices, low quality and low level of innovations, as well as in a system that is dominated by small and medium sized enterprises, where innovations, low prices and high quality are key targets for those who want to successfully operate in the markets and participate in the distribution of the common pie. If the former picture would hardly fit socialistic values and sometimes can even be shown inferior to outcomes of the planned economy, in the latter case egalitarian objectives might be achieved through interactions of independent actors in a free market system.

The issue of the proper design of the market environment raises questions about appropriate goals and methods of their achievement, and this is the place where various legal and economic theories clash and demand for empirical support to corroborate their validity. The problem is that economics is not a science about goals[4] and, therefore, even the claim that public policy should not be based on any goals at all still falls into the domain of economic sciences (see, e.g., Hayek 1976). However, the interesting point that might be found in a comparison of theories that search for the best ways of achievement of socially desirable objectives with their counterparts that try to avoid such an approach is that sometimes the latter show their superiority in the achievement of the ends of the former, even though they did not make attempts to do it.

Of course, in any case the theoretical reasoning has to be proven by actual facts, and what we can find in the telecommunications industry, that has been chosen an object for the present research, is that we have robust reasons to admit that it represents the case which does not require incorporation of any goals in public policy in order to achieve those objectives that usually justify interventions in telecommunications markets. Nonetheless, it does not signify that any institutional frameworks would be suitable for the socially desirable performance of the industry. Even when these frameworks are free from utilitarian and egalitarian ideologies, they

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[3] Stigler's (1988) note about the program of Henry Simons (see above) as cited in Shaviro (2012).

[4] The Nobel Prize winner in Economics of 1988, Maurice Allais (1995), for example, pointed out that the task of economics is to determine the efficient use of available resources for achieving of established goals, but not the establishing of these goals themselves.

still need to facilitate functioning of market mechanisms and form equal opportunities for individuals to access common resources.

Meanwhile, the picture of our days exposes delusion of the ability of public policy, that is mainly based on prevailing economic concepts that are not "purpose-free" and "end-independent", to achieve socially desirable objectives: the scope of inequality of the western world has caught up with the levels of inequality of the late XIX century (Piketty 2014. See also Stiglitz 2015); economic stagnation and social insecurity have become indistinguishable attributes of the modern life; unsustainable international order endangers the future of the entire civilization. Some alternatives for GDP[5] show that, despite the seeming growth of the economy, the quality of life of ordinary members of the western society has not increased noticeably since the 1970s-1980s.[6] The claims that "the capitalist economies of the developed world … have over the past decade looked profoundly dysfunctional" have become very common in modern academic discourse (see, e.g., Jacobs and Mazzucato 2016). This unpleasant picture has a paradoxical background of the advancements in economics, diffusion of democratic institutions and an increasing role of the government in our social and economic life. The plausible conclusion from such a situation is that all of these factors, possibly, to a different degree are accountable for the growing problems, and, thereby, the answer might be found in a socio-philosophical outlook that has been in an opposition to the mainstream developments.

The main hypothesis of this study is based on the views of the classical "pro-market" liberal scholarship that over the time has had different appearances under different names — classical liberalism, libertarianism, ordoliberalism, Austrian school, etc. This outlook has always emphasized the vital role of market mechanisms in a socio-economic system and appealed to reduce government interventions in our life, limiting them to a small number of spheres. This scholarship has always been very skeptical to the ability of the government to solve socio-economic problems and argued that only the market will lead us to the bright future, while the opposite way is merely a "road to serfdom" (Hayek 1944; see also Seldon 1984). The real supporters of a free economic order have been dissatisfied with many fundamental models and assumptions of neoclassical economics, and claimed that their ground is merely inconsistent with the reality and inevitably leads to wrong conclusions (Hayek 1949a,

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[5] e.g. Genuine Progress Indicator (GPI) or Index of Sustainable Economic Welfare (ISEW).

[6] An interesting picture might be found in the American economy, where according to a recent research (Alvaredo et al. 2017), more than 50% of the population in 2015 had lower incomes than in 1978.

Mises 1998). And this view has always understood limitations of democracy, considering it cautiously an instrument that is necessary for establishing legal frameworks for a free society (see, e.g., Rothbard 1970), and argued that "the main alternative to majority rule is … markets" (Caplan 2007).

However, apart from libertarian minority views, this outlook, in general, does not envisage the ideal world as a world without government at all. In one or another form this scholarship has underlined that the role of the government is to maintain a competitive order of an economic system and establish just rules of the game for all social members. This position leaves an enormous space for scientific research that would allow to find the best ways for formation and maintenance of a free competitive environment within equal and honest rules for everyone.

The Introductory part of the monograph — the present chapter — is aimed to highlight the main theoretical ground for the implemented approach in the present analysis of the telecommunications industry. The chapter begins with a brief introduction to the idea of a free economic order that exists in the liberal scholarship, and that has been expressed in the "competitive order" concept, which might be found mainly in views of the Austrian and Freiburg schools. After a discussion about the virtues of competition and the role that has to be taken by government in the first section of Introduction, I dedicate a section to review the position of classical liberalism on issues of property. Despite both these sections do not directly relate to the object of the research — the telecommunications industry —, they are necessary to explain the theoretical basis of the main arguments that are presented in this study. These sections explain the dichotomy between the concepts of "competitive order" and "ordered competition", that has become a core part of the research questions. Moreover, restoration of the competitive order is impossible without alteration of the current allocation of the property rights, but, again, this alteration requires a robust theoretical ground that, as I argue, might be found in the classical liberalism. In the third section, I provide a brief analysis of the evolution of this scholarship and present the main hypothesis of the research. After that, I discuss implementation of these views to the telecommunications industry and introduce the main research questions. The final section of the Introduction part describes the implemented methodology and outlines the other chapters of the monograph.

1.1. Free economic order for the new economy

One of the architects of the "German economic miracle" of the 1950s, Wilhelm Röpke, whose words have been chosen for the epigraph for this chapter, as many other pro-market economists expressed an opinion that a free economic order works better in terms of efficiency and welfare maximization than a planned economic system, and even named it "our undeserved luck" (Roepke 1959). However, the main advantage of a free economic order is not our luck that this system is better suitable to economic activity, but that the free market is the only mechanism that maintains an "obvious and simple system of natural liberty," as it was coined by Adam Smith. The growing presence of the government in our life brings threats to this system and by no means protection. The idea that the government is able to provide better solutions than the market in terms of achievement of some socially desirable outcomes is, possibly, even irrelevant to the question of comparison of market and state mechanisms, because it is merely unclear which outcomes should be considered as socially desirable; while it is apparent that utilitarian attempts of the government to achieve the undefined public interest are almost always in contradiction with ideals of the liberal philosophy.

The purpose of the reference to Wilhelm Röpke in the beginning of the chapter is to highlight the direction of the main assumptions that have been taken in the research. The Social Market Economy (SME) concept that was laid in the post-war German policy, and for which Röpke as well as Müller-Armack and Rüstow are often considered the main architects, was to a great extent based on ideas of the Freiburg school of law and economics, that is also known under the name ordoliberalism. Despite the fact that many confuse SME and ordoliberalism, it is very important to note that they had a crucial difference, i.e. their attitude toward the state participation in solution of social problems (Farmer 2006). For ordoliberals, the task for the state was to create and maintain a competitive order that will allow market forces to distribute the wealth according to merits and will result in what we may call achievement of social justice (van Suntum et al. 2011). The theoreticians of SME, unlike ordoliberals, in addition to competition policy claimed that the state has to pay attention to social issues, and, possibly, that was the main cause why German policy eventually rejected not only ideas of ordoliberalism but also of proponents of

SME, and turned to the promotion of the "welfare state" (Farmer 2006; Kerber and Hartig 1999).[7]

Walter Eucken, the leading figure of the Freiburg school, argued that a competitive order is a necessary condition for a well-functioning market economy, and that the main aim of the state should be to dismiss economic power and to create a system where all market participants have equal opportunities without possibility to influence the market process (Eucken 1995). He claimed that monopolies should be liquidated in all those cases where it is possible (Eucken 1995, p. 382), and that the de-concentrative environment must be preserved in order to exclude opportunities to affect political decision-making (Eucken 1995, p. 472). One of the central appeals of the ordoliberal school and the succeeding SME philosophy was "creating an economy where production is decentralised and takes place in relatively small units" (Schnyder and Siems 2013).

Similar ideas could be found at about the same time on the other side of the Atlantic. Henry Simons (1934) in his "Positive Program for Laissez-Faire" pleaded to eliminate concentrated market power and even to break up large corporations. Another prominent co-founder of the Chicago School of economics, Aaron Director, even suggested that the size of corporate enterprise could be limited by law.[8] It seems that the idea of competitive order was in the air of that time, and it found its comprehensible expression in works of, possibly, the most prominent advocate of classical liberalism of the 20th century, Friedrich Hayek. Analyzing the problem related to the design of a proper competitive order Hayek points out the legal system that had made the concentration a response of the market environment on its development.[9]

From the logic of this discussion of the middle of the 20th century, two major issues might be inferred. First of all, various forms of interventions into economic activity, from monetary policy to corporate law, disrupt the mechanisms of the free

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[7] It is necessary to notice that the attitude of even SME theoretics toward the welfare state was rather negative. Roepke (1959), for example, claimed that "[t]he welfare state, in its rage for egalitarianism, gives its citizens the status and opportunities of slaves…".

[8] Mont Pelerin Society, "Records of the 1947 meeting" as cited in Van Horn (2009)

[9] See, e.g., Hayek's statement (1949b): "The main field in which these problems arise and the one from which I can best illustrate my point it, of course, the law of corporations and particularly that concerning limited liability. I do not think that there can be much doubt that the particular form legislation has taken in this field has greatly assisted the growth of monopoly or that it was only because of special legislation conferring special rights … that size of enterprise has become an advantage beyond the point where it is justified by technological facts."

market, and, thereby, contribute to concentration of economic power, that, in turn, can be transformed to political power, bringing the main benefits to those on the top of the social hierarchy.[10] The second issue relates to the role of the state. The state, according to these views, should not take a side of a passive observer that allows a pseudo-"laissez-faire" system to put everything in proper places. For German ordoliberals, the laissez-faire was a major cause of the economic power concentration, even if they understood that this system in its pure ideal form has never existed in the world,[11] and they pleaded for a strong state, for which the main measure of the effectiveness of its power is determined by an ability to prevent power concentration, maintaining at the same time a system dominated by market solutions. Hayek, on the contrary, tried to avoid the idea of a strong state, but, nevertheless, claimed that state activity should be expressed in "a policy which deliberately adopts competition, the market, and prices as its ordering principle and uses the legal framework … in order to make competition as effective and beneficial as possible" (Hayek 1949b).

The discourse dedicated to the competitive order, and especially in the interpretation of the Austrian school, points out one crucial caveat that is noticeably ignored by the modern mainstream economic theories and, what is even more disappointing, by the regulatory policy that, according to its proclaimed objectives, aims to increase competition in the modern economy. This warning was raised by Hayek when he contrasted the ideas of "competitive order" and "ordered competition,"[12] and the problem lays in different understanding of the nature of competition. While the mainstream theoretical models are based on the concept of perfect competition, and for them deviation of a market from this fundamental premise signifies existence of a market failure problem, and, thus, justification for intervention; for Austrian school economists, the model of "perfect competition" is

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[10] Among the proposals of the early Chicago School was cardinal revision of monetary institutions that could bring "economic policy for a free society" (see Simons 1948). See also Eucken's claims that correspond to the aforementioned ideas of Hayek and the Chicago School and that emphasize the problem of interdependence of economic and political concentration (Eucken 1995).

[11] Such reasoning might be found in Eucken (1995). On the one hand he acknowledges that the economy was not independent from the state at this period, but on the other hand he directly names the laissez-faire as a major cause of the economic power concentration.

[12] In his essay "'Free' Enterprise and Competitive Order" Hayek notices: "… what I mean by "competitive order" is almost the opposite of what is often called "ordered competition." The purpose of a competitive order is to make competition work; that of so-called "ordered competition," almost always to restrict the effectiveness of competition" (Hayek 1949b).

the conditions where competition is totally impossible,[13] and, thereby, this is not only an undesirable, as well as impossible, situation from the social needs perspective, this is also one of the main theoretical drawbacks that leads to a choice of wrong and often devastating policies (Hayek 1949a. See also Buchanan and Vanberg 1991; Kirzner 2000; Littlechild 2017).

The critical view at the "perfect competition" as well as at the general equilibrium models has been widely accepted by the Austrian school (Shand 1984; Kirzner 1997; Boettke 2010).[14] This outlook understands competition as a "procedure for discovering facts which, if the procedure did not exist, would remain unknown or at least would not be used" (Hayek 2002. See also Kirzner 1997, 2000; Sautet 2010). This is by no means a static process, and, thus, it does not allow to make any assessment of a level of competitive prices or envisage directions of technological development. These tasks can be solved only by the market, and any attempts to affect this process undermine the effectiveness of competition. At the same time, the state can and must promote competitive forces through legal frameworks that form equal opportunities for all market participants and provide remedies for regulatory failures that are results of any interventions into the market process, even those that are unavoidable for different reasons such as provision of public goods, taxation or monetary policy.

1.2. The "pro-market" controversy of property rights

The issues of competitive order, and, moreover, the methods of achievement of a competitive environment, are very closely intertwined with the issues of property rights. Despite the "perception of competition as the dynamic, driving force for discovery in the market process has become central" in the Austrian school view (Kirzner 2000), there have also been the claims that fundamental prerequisite of the ideal world is not competition, but the institution of private property. An influential guru of the Austrian view, Ludwig von Mises, claimed that "[i]t is a popular mistake to view competition between several producers of the same product as the substance

[13] From this point of view it might be argued that "competition is a disequilibrium phenomenon" (Blaug 2002), while the fundament for perfect competition models is the idea of equilibrium.

[14] The Austrian economists are not the only critics of these unrealistic models. See also, e.g., Stiglitz (1994, 2015).

of the ideal liberal economic order. In reality, the central notion of classical liberalism is private property…" (Mises 2011). However, and it is very important to underline, that it is by far not clear which domains could be under the private property regime, and what has to be a justification for the assignment of property rights.

Private property for classical liberalism has not only been an object for worship and admiration. In some cases it can also be considered as an example of intervention in the economic activity. It would not be entirely correct to take as the basis of the liberal view the activity of "Chicago boys" in their vigorous support for privatization of the commons (Klein 2007),[15] and to blame liberalism altogether with capitalism in the growing inequality and unfair distribution of wealth, that is often a result of the growing domain of property rights (see, e.g., Perelman 2003). Quite the contrary, the liberal outlook has also had a negative attitude toward the expansion of the concept of property into realms where this institution is unjust and inappropriate, while, at the same time, pleading for strong protection of property rights where they must exist.

John Stuart Mill, the prominent liberal thinker of the 19th century, in his Principles of Political Economy claimed: "The laws of property have never yet conformed to the principles on which the justification of private property rests. They have made property of things which never ought to be property, and absolute property where only a qualified property ought to exist. They have not held the balance fairly between human beings, but have heaped impediments upon some, to give advantage to others; they have purposely fostered inequalities, and prevented all from starting fair in the race… [I]f the tendency of legislation had been to favour the diffusion, instead of the concentration of wealth … the principle of individual property would have been found to have no necessary connexion with the physical and social evils which almost all Socialist writers assume to be inseparable from it" (Mill [1848]1909).

The liberals of the middle of the 20th century echoed the appeals of John Stuart Mill. They criticized the extension of this institution and among the objects for their

[15] Some scholars point out a chosen way of privatization as a core of the problem, and distinguish the neoclassical approach and spontaneous privatization (see Beaulier 2010).

attacks was the institution of intellectual property.[16] However, not only the territory of ideas has been increasing its borders for the benefits of the richest groups of the world. With the cordial support of neoclassical economics the private property dogma has seized enormous territories of the common domain and has discredited the human-friendly picture of capitalism. The modern understanding of property rights has cut the link between the property and the results of labor of the individual, making the former merely the realm of government activity in the resources allocation process.

The growth of the private property domain has been justified by the mainstream mainly through the utilitarian reasoning of welfare maximization. However, while neoclassical economists have accepted "the maximisation of utility as an ethically desirable social goal" (Buchanan 1959), this point of view has not been universally shared by all branches of economics, and even by all adepts of the neoclassical approach, as well as it has been constantly challenged by the moral philosophy, since such a goal, in general, is in contradiction with principles of justice and liberalism. Rothbard (2006) claimed that utilitarianism captured pro-free-market minds and has led the mainstream of free-market economics to the abandonment of "free-market principles at the drop of a cost-benefit hat" (Rothbard 2006, p. 20). Amartya Sen (1970) argued that "in a very basic sense liberal values conflict with the Pareto principle … [because] it can have consequences that are, in fact, deeply illiberal … [and], if someone does have certain liberal values, then he may have to eschew his adherence to Pareto optimality."

It is worth to note that non-welfarist theories have been flourished in political and moral philosophy since the 1970s (Roemer and Trannoy 2013). John Rawls (1999) in his magnus opus, "A Theory of Justice", claimed that "laws and

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[16] See, e.g., Hayek's reasoning: "The problem of the prevention of monopoly and the preservation of competition is raised much more acutely in certain other fields to which the concept of property has been extended only in recent times. I am thinking here of the extension of the concept of property to such rights and privileges as patents for inventions, copyright, trade-marks, and the like. It seems to me beyond doubt that in these fields a slavish application of the concept of property as it has been developed for material things has done a great deal to foster the growth of monopoly and that here drastic reforms may be required if competition is to be made to work. In the field of industrial patents in particular we shall have seriously to examine whether the award of a monopoly privilege is really the most appropriate and effective form of reward for the kind of risk-bearing which investment in scientific research involves." (Hayek 1949b, pp. 113-114).
Eucken (1995, p. 351) directly claims that "economic forms that are incompatible with the competitive order … often emerge because of contemporary patent law". He also points out that "patent law … has given birth to clearly expressed tendencies toward formation of monopolies and industrial concentration" (*translation from Russian*).

institutions no matter how efficient and well-arranged must be reformed or abolished if they are unjust" and that "rights secured by justice are not the subject to political bargaining or to the calculus of social interests." Hayek (1976), rejecting the idea of social justice in general, emphasized commutative justice and understood it as the same rules for all market participants, just procedures and institutions, and argued that all players of a game should have equal chances. However, it is difficult to find a clear answer to what to do when the initial conditions of a game are not the same for everyone. Even if the rules are defined in a clear and just way, it does not mean that the previous games had the same approach to the rules, and, moreover, that they have not already created advantages for some players.

Robert Nozick (1974) argued that in order to assess justice of the final outcomes we have to know how these outcomes had been produced. Therefore, if the legal system has created an unfair distribution through what 19th century French philosopher Frederic Bastiat called "legal plunder" (see Bastiat [1850]1998), then how can this system of distribution of allocation of property rights, privileges and entitlements be accepted for preservation by the alleged supporters of "just" free-market mechanisms? Murray Rothbard in his "libertarian manifesto" provides a negative answer to the possible recognition of "property titles and rights as decreed by the very government" (Rothbard 2006, p. 36). Taking into account this moral position, it is possible to claim that restoration of the competitive order for the new economy not only requires the essential reassessment of existing institutions of property rights, and especially the domains that "have made property of things which never ought to be property," but also has to be grounded on reconsideration of the state of entitlements and distribution of rights on the means of production which we have in the modern world.

1.3. Contemporary views and the main hypothesis of the research

The modern mainstream discourse of economics to a great extent bypasses the views highlighted above. The ordoliberal outlook promoted by the Freiburg school nowadays may be found in English language literature mainly either in myths about the background of European competition law, that, according to some claims, have no connections to the reality at all (Akman and Kassim 2010), or in the scholarship

that is dedicated to historical analysis of the liberal idea (see, e.g., Schnyder and Siems 2013; Sally 1998) and very often to comparison of ordoliberal and Hayekian philosophy (see, e.g., Streit and Wohlgemuth 2000). There are also a few attempts to apply the ordoliberal approach to contemporary issues and proposals to use these ideas to broaden some modern theories (see, e.g., van Suntum et al. 2011; Zweynert 2015), but they chiefly remain unnoticed by the prevailing English language discussion. It is also interesting to notice that during the period of the Russian transition toward a market economy, the ordoliberal thoughts were taken seriously by the Russian academic society as possible recipes for construction of a market miracle, and, as a result, many ordoliberal works are available in Russian (see, e.g., Nureev 2007), but the concentrated economic and political power by the Russian elite never allowed this miracle to happen.

At the beginning of the second half of the last century, the Chicago school changed its hostility toward market concentration and, instead, has become one of the most important mainstream supporters of the increasing economic power on the global scale (Van Horn 2009, 2010). This Chicago guidance of the "liberal" reform and "deregulatory" movement has elicited wide criticism of the liberal idea in general and formed the understanding of many prominent scholars that the belief in the self-correcting power of the market is a main cause of the current tremendous level of unjust wealth distribution (see, e.g., Stiglitz 2015).

Contemporary scholars whose views have been influenced by the classical Austrian outlook do not represent a homogeneous group and differ their positions in many critical points (Shand 1984; Witt 1992). Some of them have tried to combine the neoclassical models and the Austrian idea of competition as a process of discovery, claiming that in this process markets are moving toward the equilibrium (Kirzner 1997). Others have continued to insist that the equilibrium is a misleading concept (Buchanan and Vanberg 1991; Lachmann 1976). Some still see a place for government activity in economics, while others plead to abandon any coercive power of the state and transform everything to private marketplaces (Rothbard 2006; Friedman 1989). For some of them the domain of property might be extended even further than in the mainstream proposals,[17] while others appeal for total and immediate abolishment of such institution as intellectual property rights, pointing out that "[c]opyright and patents are not part of the natural competitive order" (Tucker

[17] See, e.g., the discussion in Dolan (2014). See also Shand (1984), where he points out some Austrian claims that "property rights could be extended to cover such things as fresh air or clean rivers."

2013. See also Kinsella 2001). Moreover, it is interesting to notice that some scholars consider Elinor Ostrom's inquiries in the management of common-pool resources, that significantly differ the viewpoint from the "privatize everything" approach, as also an outlook influenced by the classical liberalism that has been expressed in the Austrian school (Carden 2014. See also Pennington 2012). The Austrian school has affected the evolution of economics, and its traces might be found in a number of contemporary theories, including the neoclassical mainstream, and, it, possibly, would not be an exaggeration to argue that "the label "Austrian" no longer possesses any substantive meaning" (Boettke 2010), or that "many of the interesting research themes and trends that have emerged over the past few decades have a distinct Austrian flavor" (Coyne 2010).

The only Austrian Nobel Prize winner, Friedrich Hayek,[18] and his philosophy continue to be highly influential for the Austrian scholarship and many other open-minded thinkers (see, e.g., Taleb 2010), and sometimes the presence of references to and long citations of his texts looks like a "mandatory exercise" for those contemporary scholars who want to underline their connection with the Austrian school (see, e.g., Boettke 2017; Coyne 2010; Storr 2010; Stringham 2010). However, it seems that unlike Hayek's works of the 1940s, the modern Austrian view that stems from works of Ludwig von Mises often faces the same problem as the mainstream — unrealistic assumptions of the implemented models, what even allows to claim that Austrians "commit their own version of the Nirvana Fallacy" (Carden 2014. See also Dolan 2014). While the mainstream derives its models from idealistic economic circumstances that never can exist in the real world, the contemporary Austrian school often bases its reasoning on the premise that the problem of government interventions in the economy might be solved.[19] In contemporary Austrian papers, for example, we can find that the institutional precondition of a free society "is the rule of law, private property, and freedom of contract" (Boettke 2017. See also Sautet 2010), what Hayek, in 1949, expressed in a quite different way: "we must … above all beware of the error that the formulas "private property" and "freedom of contract"

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[18] Of course, it is a quite contingent classification. In a broader sense, some other prominent Nobel Prize winners, such as James Buchanan or Vernon Smith, have demonstrated very similar views with the Austrian school.

[19] Murphy and Gabriel (2008) point out that one of the imaginary constructions of the Austrian economics is "the pure, unhampered market economy, in which neither the government nor other groups interfere with the voluntary exchange of private property." Following Mises' arguments (1998), they acknowledge that "[s]ome critics object that this procedure reflects the biases of the orthodox economist…".

solve our problems… Our problems begin when we ask what ought to be the contents of property rights, what contracts should be enforceable, and how contracts should be interpreted… We cannot regard "freedom of contract" as a real answer to our problems if we know that not all contracts ought to be made enforceable…" (Hayek 1949b).

The opponents of the free market very often fail to recognize that the system that they blame in the growing social problems is not a system that in any sense might be considered as a free market system. However, there is also a situation when pro-market thinkers show the same pattern. Stiglitz (2015) is totally right that inequality is a tremendous problem, and he is, possibly, better in the diagnosing than those who believe that the outcome of the liberalization movement is closer to a free market outcome than the previous system of the state control (see, e.g., Boettke 2017). It is by far not clear that one of these systems has any superiority over another simply because in both cases we are dealing with regulatory concentrated economic power that cannot produce an outcome of an open market environment.

The hypothesis of the present research takes into account the fact that we cannot avoid interventions of the government in our economy, and we will, possibly, always have its presence, at least, in the monetary system, in the system of public goods creation or in the system of taxation. Moreover, even legal frameworks that determine the functioning of corporations, financial markets and private property, are per se examples of government interventions in the ideal free market mechanism. Therefore, the idealistic models of the Austrian school, despite they are, possibly, able to grasp the nature of the market economy more correctly than the neoclassical mainstream, are, nevertheless, not the models that entirely correspond to the reality. They correspond to the free market world that is never achievable due to inevitability of the government participation in our economy.

This presence of the government by various means affects performance of markets, and here it is crucial to acknowledge the interdependence of all spheres of our life (see Eucken 1995). Even if some particular markets are totally free from any kind of industrial policy, decisions of people who are doing their business in these markets are inescapably affected by the presence of the state in other fields. Boettke, for example, in this sense points out a connection between monetary policy and other activities: "[i]f government policy distorts the monetary unit, exchange is distorted as well" (Boettke 2010), but the modern system of fiat money is entirely a product of government activity, and, thus, it is very idealistic to use in the reasoning the

construction "if" — we have to base the logic on the proposition that government policy always distorts the monetary system and, thereby, always distorts exchange.[20] Even if it is possible to agree with the statement that "various market regulations … or the existence of privileges in a few markets … [do] not necessarily destroy [the market process]" (Sautet 2010), we cannot deny that it affects the outcome of the entire process and provides advantages to some market actors and, thereby, hindering the competitive process and leading to an unjust non-market outcome. Moreover, the interventions that are present today are not limited by a small variety of areas — they go much further and this fact cannot be neglected in economic reasoning,[21] regardless of one's beliefs in self-correcting power of the market.

It is a big mistake to ignore effects of regulated spheres on unregulated marketplaces and claim that some undesirable outcome is a product of inability of the market to work efficiently for public needs. Very often, this inability is a consequence of interventions in other areas, that, in the long run, lead to concentration of markets and concentration of economic and political power in society, and precisely this feature of the government-market interconnection was clear for the liberal academic community in the middle of the 20th century. The result of this concentration is the growth of wealth in hands of a few and unpleasant consequences for the masses. Could it be named as a market failure is by far not clear, since it seems that it is more adequate to name the problem as a regulatory failure, especially, if to take into account that attempts to "solve" such "market failure" issues have never been ceased by regulation.

Meanwhile, markets with high concentration are not able to satisfy social needs and very often raise questions about interventions. The reasonable response to this concentration is regulation and redistribution of incomes, but in this case we have to rely on the benevolence of the government, or, even more precisely, benevolence of those who have opportunity to use government power for their own personal needs, and on the theories that are a ground for justifications of implemented solutions. From the public choice perspective it might be inferred that the government is always an instrument to enrich those who have access to policy formation and, what is very important, is that they always have discretionary power to choose those theories that

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[20] About the Austrian critique of "the very existence of a central bank" see, e.g., Sechrest (2005).

[21] It is necessary to acknowledge, that such claims are not so rare in the contemporary literature that has the Austrian context. See, e.g., Witt's (2003) statement that "policy interventions are so pervasive in all modern economies that they cannot be ignored."

better correspond to their purposes in explanations of their decisions of achievement of the public interest that, at the same time, is never defined in reality.

The paradox is that the "free market" problem, that in fact is never free, and the most widely accepted response to the "imperfections" through regulation lead to the same situation — concentration of economic and political power with the byproduct of social problems. The solution of the regulatory failure problem (or we can name it the regulatory-formed-market-failure problem) through regulation often leads to escalation of the problem either through increase of social deficiencies, decrease of the economic outcome and (or) through suppression of human liberties.

The ordoliberal view provided an alternative option. According to this approach, there are no needs to regulate the economic process and redistribute incomes, but what should be done is to create a competitive order that will yield the most efficient solutions for our society in all spheres at once. In other words, the idea was to regulate a form but not a process. However, the Freiburg school did not base their recipes on understanding of competition as a process of discovery,[22] and this drawback might be resolved in the synthesis of different approaches of pro-market liberal theories.

Instead of considering competitive markets as conditions where prices are at some "mythical" competitive level or, in terms of neoclassical economics, close to marginal cost that can never be defined due to the subjective nature of this phenomenon,[23] we have to look at the innovativeness of markets, "variations in prices and products" and their ability to search for and satisfy the needs of other market actors (Littlechild 2017). However, what might be a response to the lack of competitive order, or, in other words, to the deficiencies of concentrated market structures to work well? The response, that can be linked to the Freiburg school, is to break up the giants; and it is very important to not assess any efficiency in the divestiture procedures, just because we cannot correctly assess it due to the dynamism of the process and spontaneous results that would be brought by uncontrolled market mechanisms.

In non-orthodox pro-market theories we can find a view that economics should not focus on the task of optimal resources allocation, but on the market process and institutions that facilitate this process (Buchanan 1964; Coyne 2010). If the

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[22] However, Eucken also rejected the mainstream model of competition, claiming that this model denies to determine the real competition as it exists in the economic reality. (Eucken 1995, p. 77).

[23] See explanation of subjectivist approach of the Austrian school, e.g., in Stringham (2010). See also Buchanan (1999).

concentrated form is unable to provide expected results, we have to give a chance for competition; and, moreover, there are obvious reasons to anticipate that a de-concentrated form of an industry will positively affect the landscape of related industries and create opportunities for innovation activity in different fields at the same time. The unsatisfactory situation with inability of the European telecommunications giants to modernize their networks in the 2000s and the beginning of the 2010s, where the UK is one of the most "fascinating" examples[24] of how the real market never works, is the consequence of the ordered competition regime (Burton 1997), market concentration and unwillingness of the governments to disperse the economic as well as political power.

In addition to the market de-concentration, the competitive order requires openness of the markets and resources. The regulatory burdens should be minimized and almost totally non-existent for small and medium-sized enterprises, and all existing regulatory formed entry barriers — from licenses to any necessary state approvals — must be removed entirely before the terms "liberalization" or "deregulation" might be properly used. Moreover, those assets that have been "stolen" from commons, that have been appropriated under the guise of the common welfare maximization that in fact had maximized welfare in pockets of the rich, must be returned.

In summary, the main hypothesis of the research is based on liberal scholarship and might be expressed in the following form: The main causes of concentration in the new economy are not inherent characteristics of the field, but the regulatory efforts to cope with the problem of market failures (or, possibly, it could be better described as regulatory-formed-market failures) and, thus, the markets of the area could have a pluralistic landscape if regulation promoted alternative objectives. Such an alternative goal might be considered the formation of the competitive order regime where regulation facilitates openness and accessibility of common resources, prevents concentration of economic power, provides remedies for government intrusions into the economy that cannot be avoided for political and social reasons, and, at the same time, does not intervene in the market process. The policy that would be based on this concept is feasible and can produce more satisfactory results from the social needs perspective than existing approaches of regulation that are mainly based on regulation of the market process. The very important task in design of institutional frameworks that would maintain the competitive order is not to substitute the

[24] See the figures in OECD (2015).

competitive order by ordered competition, the regime where the state governs the field according to its perception of how the field works and how the competition might be facilitated. The choice of telecommunications as the main object of the study is determined by the view that this area represents the core infrastructure part of the new economy, share similar characteristics with many fields of the new economy mainly due to the presence of network externalities and has a long tradition of operation under the close government supervision. Thereby, it might be argued that the correct understanding of the role of regulation in the highly-concentrated landscape of telecommunications markets is able to provide alternatives for regulatory policy of other areas of infocommunications and Internet-based activity.

1.4. The order of the telecommunications industry and the main research questions

The views at the appropriate order of our economy described above, possibly, find their quintessence when discussion touches utility regulation. The industries from this domain until recently had been long recognized as examples of natural monopolies, and the telecommunications industry is particularly attractive for the present analysis due to its vital role for spheres of the new economy.[25] Even nowadays this natural monopoly perception of the sector has not entirely evaporated from textbooks and the academic discussion, and still determines to some extent the regulatory efforts to cope with market failure problems.

Meanwhile, for many Austrian economists, the natural monopoly paradigm has been conceived as a delusion due to the inconsistence with the real world of the models of economic equilibrium and perfect competition that provide a theoretical ground for this concept (see e.g. Rothbard 2009; DiLorenzo 1996. See also Thierer 1994). Moreover, the empirical evidence of the earlier days of the telephone industry rather points out the phenomenon of diseconomies of scale (see Clark (1923) as referred in Thierer 1994; see also Mueller 1989, 2013), that actually signifies the absence of natural monopoly characteristics even from positions of the neoclassical approach. However, even the North American experience, where the competitive

[25] Here I define the term "new economy" in the same way as it was used by Richard Posner (2001), who denoted through it three industries: computer software, Internet-based business, "communications services and equipment designed to support the first two markets".

environment of the first decade of the last century proved its superiority over the monopolistic alternative (see Mueller 2013), by no means can be considered as a truly competitive order. Intervention in the field of intellectual property had allowed Bell Telephone Company, and its successor AT&T, to accumulate the amount of economic power that eventually was sufficient to defeat the competitive process through political means (Janson and Yoo 2013), and this fact per se exposes the insight of ordoliberals in their appeals to dismiss economic power concentration as incompatible with a free economic order.

The last decades of the 20th century yielded a surge of "liberalization" in various spheres of our economy, and the "non-orthodox" liberal camp also provided its proposals for reforms. Stephen Littlechild, whose "economic-philosophical background" can be linked to the Austrian school (Burton 1997; see also Beesley and Littlechild 1989; Littlechild 2017), in 1983, presented his report "Regulation of British Telecommunications' Profitability" to the British Secretary of State,[26] where the views of the head of the government of that time — Margaret Thatcher — had been influenced by the Hayekian philosophy.[27] This proposal considered the abolition of ex-ante regulation as an ultimate goal of the reform, and stated that "[c]ompetition is indisputably the most effective — perhaps the only effective means — of protecting consumers against monopoly power. Regulation is essentially the means of preventing the worst excesses of monopoly; it is not a substitute for competition. It is a means of 'holding the fort until competition comes" (as quoted in Stern 2003). Unfortunately, real competition never came. The UK government had eventually chosen to restrain the development of competition, and that allowed the colleague of Professor Littlechild from Birmingham University, John Burton, to conclude about 15 years later that "the system has not evolved in practice as prescribed by its principle architect into one of the rule of the competitive order. Instead, it has become a system … [of] ordered competition, … which has quite different characteristics from that of the competitive order" (Burton 1997).

Again, the roots of this difference are in the understanding by a regulator of what competition actually means (as well in the ultimate goal of the regulator and particular bureaucrats — to regulate permanently or to cease the intervention after a particular point). The Austrian perspective tells us that competition is a natural

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[26] See analyses of the report, e.g., in Stern (2003), Burton (1997).

[27] See, e.g., "Thatcher, Hayek & Friedman" on the website of Margaret Thatcher Foundation, at http://www.margaretthatcher.org/archive/Hayek.asp.

process of a free market, but not a product of human design. When regulation maintains competition through ex-ante interventions that are aimed in the domain of property rights — such as in the case of mandatory local loop unbundling in telecommunications — we face an example of ordered competition, that is not a result of spontaneous order of free and voluntary interactions of economic actors. It is even might be argued that regulation "touch[es] the central nervous system of the competitive order" (Handler 1973), while "the actual competitive order is the result of individual decision-making with regard to prices and quantities …, … the result of the choices individuals make in their capacity as entrepreneurs" (Sautet 2010). However, the problem also is that the existing distribution of the means of production is not an outcome of a system where the champions have won their titles through operations in the market process — they are the winners in the usage of state mechanisms and their achieved economic power is an underserved competitive advantage that would allow to maintain an inefficient order even if the industry will be freed from all regulatory burdens. Therefore, ex-ante interventions that are necessary to achieve the competitive order could be entirely justified from the "pro-market" positions, and that is what we can find in Littlechild's statement above.

The distinguishable feature of the telecommunications industry at the moment of the start of the reform in the 1980s — 1990s is that market positions and economic power of incumbents by no means were results of market forces. It was regulatory granted market power that had to be dismissed at the very beginning at the same time with removal of all barriers for competition in all subfields of the industry in order to move the industry into the direction of the competitive order and to force market mechanisms work. However, the understanding of local loops as an example of a natural monopoly (see, e.g., Laffont and Tirole 2000), beliefs that the presence of sunk costs leads to underinvestment in telecommunications infrastructure and desires to promote efficiency of the field and avoid wasteful duplications shaped the policy of the reform and resulted in the choice of the "ordered competition" system. As a result, the experience of other western European countries was rather similar to the UK template in the efforts of the governments to eschew the competitive order in the industry.

This dichotomy between the "competitive order" and "ordered competition" concepts raises some interesting issues that have given a birth for the main questions of the research, that are also followed from the hypothesis outlined above. First of all, *does the example of the telecommunications sector suggest that the "competitive*

order" is able to satisfy the actual needs of society better than the "ordered competition" alternative? As was mentioned earlier, despite a free economic order is the only environment that promotes and maintains individual freedom, for modern society this is not a sufficient argument for a policy to be adopted. Therefore, the task of "pro-market" thinkers is to demonstrate that the market is also better suitable to maintain other values that are mainly associated with welfare maximization and social issues, and the telecommunications experience actually shows that it does.

The first question is highly intertwined with the second one — *Why did telecommunications policy eventually reject the idea of promotion of a free economic order and, instead, focus on close supervision of the field through regulatory means?* This question leads us to the realm of public/private interests separation of the nature of regulation. Are there any public interest rationales for the way of the reform and modern interventions in the industry's activity, or has the policy been mainly driven by private interests of some interest groups? The answer is able not only to give reasons to reassess our attitude toward telecommunications policy, but to revise our general perception of the growing regulatory state.

However, even if we have a reasonable ground to abolish the public interest explanation of regulation and assume that regulation has always served interests of a few, we still need to understand why the main justifications for public policy fail to find social benefits in the free competitive order. In other words, why characteristics of the industry that shaped the direction of telecommunications regulation are not obstacles for development of competition. Therefore, the third question might be formulated as: *Why can the theories that are focused at inherent characteristics of the industry such as local loops monopoly or sunk costs paradigms not justify interventions in mechanisms of the free market*?

The understanding that the market can work better than the state mechanism and that regulation cannot substitute forces of the competitive order without disturbing the entire market machine is a good intellectual exercise, but it has a little value if we escape from reality of our economy that is rather formed by the state than by the market. The libertarian dream of abolishment of all state interventions, if we imagine a possibility of such an event, would hardly bring a libertarian paradise. The result would rather concentrate the economic power in the hands of those who now are forced to share it with government officials. The competitive order in its classical form assumes that this power has to be eliminated in the first place (see Hayek

1949b, Eucken 1995). It could be a disagreement between the Austrian and Freiburg schools about the role of the state in maintenance of this competitive regime, but, as was highlighted above, even the radical anarcho-capitalistic form of libertarianism agrees that we cannot accept "property titles and rights as decreed by the very government", and, thus, we have a perfect "pro-market" justification for the competitive order formation. Therefore, the final question of the research is *what are the prerequisites of the competitive order in the telecommunications sphere*?

The answers to the research questions contribute to several fields at the same time. First of all, they allow to look at the telecommunications industry as a highly competitive field in all of its segments for which the natural monopoly paradigm could never be appropriately applicable. Thereby, it broadens the understanding of dynamic competitive process in a form that has been mainly advocated by the Austrian school by the study of contemporary empirical experiences and examination of regulatory failures to promote real competition in the field.

Secondly, they contribute to our understanding of the phenomenon of the competitive order and possible means of its achievement. The research provides empirical support for the claims about superiority of the competitive order regime over the widespread adopted solutions of ordered competition, not only from positions of economic efficiency, but also from the social perspectives view.

Thirdly, the results of the research contribute to the discussion about public and private interests explanation of public policy and provide suggestions how to tilt the state mechanisms in the side of public needs.

The telecommunications field is not only an infrastructure of the new economy, it also shares many characteristics with other areas of modern economic activity mainly because of its network architecture. Therefore, the telecommunications experience with the failure of the policy to promote the competitive order and with possibility, at the same time, to represent a highly competitive field leads to valuable conclusions about the role of the state in the new environment. I believe that the results of this research and the lessons that are drawn from the telecommunications history may be highly relevant to the modern debates concerning regulation of spheres of the new economy.

1.5. Methodology and chapters outline

The non-orthodox liberal theories differ from the mainstream not only by the underlying assumptions and philosophical concepts, but also by methods of scientific researches. The Austrian school of economics from the moment of its foundation by Carl Menger in the late 19th century has put in the core of its paradigm methodological individualism and rejected the use of mathematical apparatus for analysis of market phenomena (see, e.g., Shand 1984). They have vigorously criticized the widespread attempts to adopt methods of natural sciences to study the social domain and considered it merely "counter-revolution of science" (Hayek 1955). According to this view, instead of looking at abstract equations of different states of equilibrium that are based on unrealistic assumptions, "the logical economist" has to look at the real life activities of market actors, because the main task of economics is the analysis of the market process (Mises 1998). It might be argued that if economic theory was based on the main Austrian propositions, it "would be grounded in verbal logic and empirical work focused on historical narratives" (Boettke 2010).

Eucken (1995), discussing the appropriate methodology, used the term "scientific morphology" and argued that economists have to study real households and enterprises in order to discover existing forms and their interrelationships. Methodological approach of constitutional economics promoted by J. Buchanan and the Virginia school of political economy, that, according to some claims, has explicit similarities with ordoliberals,[28] is also grounded on understanding that "[i]nstead of focusing on the issue of allocation, … economists should focus on exchange relationships and the institutions within which exchange takes place" (Coyne 2010).

The present research uses the approaches outlined above as the main methodological frameworks that are intended to provide answers to the research questions. The main efforts are aimed at the analysis of forms of economic activity and relationships in telecommunications industry that have emerged within institutional arrangements; and historical narratives allow to understand the causes of their formation, evolution of the process and possible alternatives to those forms that prevail in the contemporary regime, which is very far from the competitive order ideal. The fact that different institutional arrangements have resulted in different performance of telecommunications markets gives opportunity for such analysis and

[28] See, e.g., Kerber and Hartig (1999), who argue that constitutional economics "can be seen as very close to the Ordoliberal idea that after setting down an institutional framework of rules of the game, the state should refrain as much as possible from intervening in the game."

for understanding the impact, that is mostly negative, of the attempts to regulate the market process on outcomes and concentration of the industry.

The main body of the monograph consists of four chapters. Two of them (Chapter 2 and Chapter 5) are based on published scientific articles, while others on manuscripts that are in the submission stage. After the explanation of the main idea of the research and introduction of the main research inquiries, Chapter 2 investigates the main regulatory frameworks of telecommunications industry through the views of the market failure and regulatory failure concepts. It focuses at the key aspects of the European telecommunications policy, such as distribution of radio spectrum, access to network elements, alleged necessity of harmonization of networks and so on, and examines possible justifications for such interventions and validity of the underlying argumentation. The systematic approach of the European policy makes it a useful template for this purpose, while similarities with these frameworks might be found in totally different institutional arrangements.

The next part — Chapter 3 — continues this discussion and focuses at the intersection of public and private interests in telecommunications policy. As a main argument against state presence in the industry, it uses the evidence that this activity impedes competition and contributes to the concentration of the sector. This argument is based on the empirical facts of the early days of the industry's development in the United States and recent advancements in the growth of the broadband access penetration in the Russian Federation and some other Eastern European countries. The chapter introduces the view on the possible competitive order in telecommunications and what measures had (and has) to be done for its achievement. The reasoning of this part of the research dissects the mainstream hypotheses and argues that they have always been highly beneficial for the powerful groups of the industry. The methodological support for private interests claims in this chapter is mainly based on public choice theory, that to some extent echoes the ideas of ordoliberalism and the Austrian school.[29]

Despite its unchallengeable dominance in the western, and particularly in the European, academic discourse, the neoclassical creed has faced "quandaries" in its attempt to explain the industry's development in Russia (Stiglitz 1999). It seems that the main explanation of this problem is that the real competitive process is not envisaged in the prevailing models that are based on the perfect competition concept.

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[29] About the intersection of the Austrian economics, public choice and ordoliberalism see, e.g., Streit and Wohlgemuth 2000.

It is not a task for the state to analyze whether an economic system has too much or too little competition, because an optimal competitive level, as well as, behavior of market participants should be shaped by market forces, but not by regulation. The task of the state is to provide remedies to regulatory failure situations, and in the case of regulatory formed monopolies to dismantle these monopolies. Meanwhile, the Russian example perfectly fits the concept of competition promoted by the Austrian school, and this makes it particularly lucrative for the investigation. Chapter 4 represents a detailed case analysis of the development of the Russian industry and the causes of its recent (and in some fields even current) pluralistic landscape and innovation activity. The crucial feature of the fact that the industry in Russia has been much closer to the understanding of the competitive order than, for example, the Western European countries is that this order was mainly the result of market forces, but not the outcome of regulation, that, on the contrary, tried to suppress competition and to promote interests of the most powerful actors; and this fact again reflects the theories advertised by the non-orthodox economics.[30] The analysis of the Russian case gives an essential support for the claims of the previous chapters and dismiss the arguments of the skeptics about the possibility to create a real competitive environment in the industry (see, e.g., Stern 2003; Armstrong and Sappington 2006).

The idea of competitive order, especially in the representation of Walter Eucken (1995), was incorporated in a more generic concept of "the interdependence of orders", according to which, our economic life is closely interconnected with social, cultural and political orders, as well as an internal economic order of a country is intertwined with an international economic order, and, thus, this interdependence requires harmony of all of these spheres (Eucken 1995). However, in a more narrow sense it is apparent that there is a phenomenon of interdependence of various industries,[31] and the closer the industries relate to each other, the more the order of one of them affects the order of another.

Since the beginning of the industry's development and until the last decades of the 20th century, the business of major telecommunications incumbents included not only provision of services, but also production of telecommunications equipment. The separation of the industry made possible competition of the manufacturing units for

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[30] For example, in the Austrian view, we can find the concept of "intervention entropy" (see Burton 1984). See also De Soto (1990).

[31] The idea of interconnectedness is also present in the Austrian view (see, e.g., Sautet 2010; see also the "connexity" concept of Ludwig von Mises (Mises 1998)).

the markets of those parts that focused on the services provision. The ideas of interdependence and competitive order assume that a competitive landscape of one of this field requires a competitive landscape of another, as well as a concentrated market in one of these segments contributes to the concentration of another. Therefore, the analysis of the "competitive order" issue in telecommunications would be incomplete without examination of interdependence that could brought the competitive environment for both of them. The task of Chapter 5 is to look at this interdependence and to assess the impact of government interventions in both areas to the eventual concentration and prevention of competitive order formation.

The major methodological support for Chapter 5 is grounded on the concept of disruptive innovation that might be linked to the Schumpeterian view at the creative destruction process (Schumpeter 1942), which, in turn, is highly connected with the Austrian understanding of competitive market as a process of entrepreneurial discovery (see, e.g., Kirzner 2000; Sautet 2010). The chapter shows how interventions in the market process, that create favorable environment for the development of the mainstream technology, undermine the essence of the competitive order and impede appearance of disruptive innovations, transforming fruitful ideas that threaten the established status quo into sustaining innovations of major players.

The final remarks of the research are presented in Chapter 6 — Conclusion. It formulates the precise answers to the aforementioned research questions on the ground of reasoning and empirical support presented in the monograph. In addition, it also introduces the view on application of the results of the research to other fields of the new economy.

CHAPTER 2

Market and Regulatory Failures in Telecommunications: Analysis of the Main Regulatory Frameworks

The chapter is based on the article:
D.Trubnikov (2017), Regulation of Telecommunications: The Choice Between Market and Regulatory Failures. *The Law, State and Telecommunications Review* 9(1): 29-48.

"The market economy … neither maximizes nor minimizes anything. It simply allows participants to pursue that which they value, subject to preferences and endowments of others, and within the constraints of general "rules of the game" that allow, and provide incentives for, individuals to try out new ways of doing things."

J.M.Buchanan and V.J.Vanberg (1991), The Market as a Creative Process

2.1. Introduction to Chapter 2

Debates about the role of government in economy are very old. It has been incorporated in the mainstream of Economics that market mechanisms sometimes lead to undesirable situations, so-called, "market failure", and, therefore, there are needs to interfere in the market in order to mitigate the problem. Meanwhile, these interventions also can have a negative impact on the economy, and, such consequences can be considered as government or regulatory failure.[32]

[32] The term "regulatory failure" can be often met in academic literature with the same interpretation as government failure, but it can also mean the failing to achieve certain regulatory goals regardless of the economic aspects (see, e.g., Baldwin et al. 2012).

The imperfection of the market for many seems as an apparent justification for the attempts to regulate the economic activity of human beings, but, at the same time, it might be argued that undesirable outcomes of existing markets is, in fact, consequences of the persistent government presence in the market process. Moreover, those groups of people who have real access to the formation and exploitation of regulatory mechanisms have an enormous temptation and tremendous opportunities to use the legal system for their own benefits. Therefore, it is of a paramount significance to understand how regulation can be used for the interests of such interest groups and to expose the relationship between regulatory frameworks, that should be aimed to remedy market failures, with interests of those who create them or can have access to their formation.

Interesting examples where regulation provides enormous opportunities for policy makers to enrich some powerful groups at the expense of society can be found in industries that heavily depend on innovations and play a significant role in modern society. The failings of regulation in this field affect the welfare of the population, contribute to the growth of inequality and undermine incentives for innovations in the spheres of the new economy. From this point of view, the telecommunications industry — the main object of the present study — is an attractive area for such an analysis, and, furthermore, the concentration of power in this sector allows to assume that this situation is a result of the government activity, and, therefore, can be considered an example of government failure.

The chapter begins with a brief review of theoretical approaches to the determination of market and government failures. The subsequent parts are devoted to the transformation of the landscape of telecommunications over the last decades and to the analysis of key issues of regulatory policy in this field. The main emphasis is made on the reasons for government interventions in telecommunications markets from positions of the theory of market failure, and, at the same time, the chapter highlights the issue through the viewpoint of theories of government failure, explaining how and why these interventions lead to the policy failings and oligopolistic structure of the industry.

2.2. Government failure vs. market failure

In Economics, the conception of “government failure” is another side of the coin of “market failure”. Despite the idea of the supporters of the invisible hand that market mechanisms lead society to the increase of welfare for everyone, there is a

widely accepted assumption that the market in a number of cases fails to achieve this goal, and, thus, there are needs for government interventions.

One of the most prominent critics of the free-market view on the economic system Joseph Stiglitz, who argued that "the reason that the invisible hand often seems invisible is that it is often not there" (Stiglitz 2007), in his book "Economics of the public sector" (Stiglitz 1988) distinguishes eight reasons for government interventions in markets: competition failure, necessity to produce public goods, presence of externalities, incomplete markets, imperfect information (or information failure), unemployment and periodical instability, unequal distribution of incomes, "bad" consumers' decisions.

According to his opinion, the first six of these reasons directly relate to the problem of market failure, because they are expressed in the lack of Pareto efficiency in the economic system, while the latter two can be justified, even if market mechanisms work perfectly in economic terms, by the principles of justice, humanism and paternalism. The concept of market failure includes various approaches and understandings of what constitutes this failure, and whether these aspects in reality lead to an inefficient outcome for the economy. Nevertheless, the theories of market failure, that prevail in the mainstream of economics, mainly are concentrated around the framework described above.

Meanwhile, it is also generally recognized that the problem of "market failure is only a necessary but not sufficient condition for governmental intervention" (Mazzucato and Penna 2016). Not only the market, but also regulatory bodies consist of self-interested agents and, as a result, decisions of policymakers, officials and bureaucrats can lead to the same or even worse outcomes than the performance of imperfect market mechanisms. The main advantage of the market in comparison to the government is that the market is relatively neutral to market participants. In an ideal world, it favors those who are better or more lucky, instead of those who are closer to policymakers. At the same time, anyone who tries to participate in the creation of rules cannot be free from their personal interests, beliefs or biases.

Acemoglu and Verdier (2000) point out that the necessity of government interventions often requires a choice between market failures and corruption, because the latter is the result of any intervention in the market since any intervention redistributes resources, and they conclude that corruption is merely "unavoidable price to dealing with market failure". "Corrupt incentives are the nearly inevitable

consequences of all government attempts to control market forces" (Rose-Ackerman 1978), and, that is why, some pundits even claim that they would prefer to live in the presence of market failure, rather than to have a risk of "widespread government failures" (Mills 1986).

It is important to note that not all schools of economic thought share the opinion that market imperfections can be considered as justifications for interventions in the market process. The Austrian school has constantly challenged rationales for the market failure concept. Even the problem of negative externalities, the issue that is generally perceived by the vast majority of social scholars as an obvious example where government must intervene, for Austrian economists has never formed a basis for regulation. Quite the contrary, from the point of view of the Austrian school, the problem of market failure "should more properly be explained by the inadequacies of the state, because of its failure to delineate and uphold property rights efficiently" (Shand 1984).[33]

The criticism of the interventionist approach has been shared by various branches of economics, and has been promoted noticeably by the Chicago school. Harold Demsetz (1969) pointed out that interventionists have adopted the "nirvana approach", because in their analysis of real markets they substitute existing imperfect institutional arrangements by ideal performance of government mechanisms. Another prominent Chicago school economist, George Stigler (1971), in his "Theory of Economic regulation" argued that the state "is a potential resource or threat to every industry in the society," and, therefore, the main players of the industry are tempted to capture this resource in order to maintain their positions. Thus, Stigler distinguishes four main policies that are sought by any industry or, I suppose it would be also correct to say, by incumbents of any industry from the state: "direct subsidy of money", "the control over entry by new rivals", affection of substitutes and complements, and price-fixing.[34]

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[33] Rothbard (2009), for example, claims that "cases of "external diseconomy" all turn out to be instances of failure of government — the enforcing agency—adequately to enforce individual property rights … [T]he outpouring of smoke by factories pollutes the air and damages the persons and property of others, it is an invasive act. It is equivalent to an act of vandalism and in a truly free society would have been punished after court action brought by the victims… [T]he remedy, in a free society, is not the creation of an administrative State bureau to prescribe regulations for smoke control. The remedy is judicial action to punish and proscribe pollution damage to the person and property of others."

[34] Later, a contribution to the development of the economic theory of regulation has been done by such prominent scholars as Peltzman, Posner, Becker, Tirole and others, but for the purpose of this article we can start from the initial version.

It can be argued that in the New economy these four directions are not enough to maintain or to enhance positions in the market. Moreover, for powerful players of the most advanced industries it is much more advantageous to control the innovation activity of the entire industry. Industries that allow to maintain positions of main players through the inherent characteristics such as network effect, economies of scale or scope, or first mover advantage already have natural barriers for potential entrants. Nevertheless, if entry accompanies by implementation of breakthrough technology it can subvert the entire market, including markets for substitutes and complements, and undermine the business of established firms. That is why the control over technological development and innovations which can enter the marketplace become even more important for incumbents than all other forms of policy. Using Schumpeter's approach of innovation development, it is possible to formulate a proposition that incentives of established firms to capture control over technological development stem from the obvious purposes to protect their positions from the impact of the creative destruction process.[35] In view of the possibility to be leapfrogged, they have a choice: to innovate or to suppress the innovation activity of others.

The appearance and development of public choice theory have allowed to look deeper at the problem of regulatory capture, and fundamentally challenged the assumptions about the public interest nature of regulation (e.g. Buchanan and Tullock, 1999; Holcombe, 2015).

However, regulatory capture is not the only factor that leads to the failure of regulation. Joseph Stiglitz, whose approach toward market failure was described above, argues that causes of government failure are incompetence and corruption: "In some cases it is a matter of incompetence, in others of corruption; in some cases it may be hard to distinguish the relative role played by each" (Stiglitz 2009). Indeed, even the incompetence can be a consequence of cronyism or deliberate choices of decision makers to hire less competent but more loyal subordinates (Egorov and Sonin 2011).

Meanwhile, selfishness and bounded rationality are not the only features, that characterize imperfection of human beings. There are also laziness, recklessness, fear, etc., and, thus, the government failure cannot be described exclusively through the incompetence and corruption. There are numerous institutional aspects and there are

[35] Antonelli and Gehringer (2017), for example, notice that "slow rates of technological change help to consolidate barriers to entry."

also insufficient resources and epistemological limitations (Baldwin et al. 2012). We do not have knowledge about the future, we are not always able to assess the probability of certain events, and have to make our judgements under uncertainty relying on heuristics and biases (Tversky and Kahneman 1974), but, nevertheless, even such limitations can be used by those who have a political power for their own benefits.

Of course, it is not always clear, what more tilts regulation toward suppression of innovations and concentration of market power: regulatory capture or other regulatory failings, but understanding of the relationship between regulatory frameworks and interests of main industry players is able to expose the roots of the problem.

2.3. Transformation of the landscape of telecommunications

One of the main ideas of "private interest theories of regulation" is that regulation is used by private entities in order to hamper competition (Morgan and Yeung 2007). There are claims that the aim to suppress competition was once among the main objectives in regulatory policy of the US (Dempsey 1989). These objectives were supported by economic justifications for such decision making. For example, one of the rationales for legal suppression of competition in industries that heavily depend on infrastructure, such as transportation or telecommunications, was based on the assumption that the immaterial nature of the products of these industries does not create incentives to invest in the expensive infrastructure without possibilities to obtain economic rent that could be provided by a monopoly position (See, e.g., Dempsey 1989).

According to some explanations that justify creation of entry barriers: " "good regulation" is supposed to constrain entry so that the economies of single firm production can be achieved" (Joskow and Rose 1987). It is not a rare view in Economics that monopolistic markets are able to provide more benefits to society than competition. Some even claim that "in an economic paradise, where a regulator is omniscient, benevolent, and able to fulfill any promise he makes, competition cannot improve upon regulated monopoly" (Armstrong and Sappington 2006). Such justifications perfectly supported monopolistic structure of telecommunications when this industry was entirely in the hands of the state. Indeed, before the end of the

1980s in most of the countries, regardless of capitalistic or socialistic character of their economy, telecommunications were under the full control of the governments as state-owned enterprises.

The most remarkable exception from the state-owned monopoly model was the telecommunications sector of the United States, where the major player was private company AT&T. Strictly speaking, AT&T was not the only company that provided telecommunications services in the US. There were also, so-called, independent telephone companies, but on most of the territory of the country, AT&T was able to establish a monopoly and became one of the biggest corporations in American history. AT&T was a vertically integrated company that provided the full range of telecommunications services and produced telecommunications equipment for the industry. In 1974, the United States Department of Justice filed an antitrust lawsuit against the company, and the consequence of this action was the consent decree about divestiture of AT&T in 1982. As a result, in 1984 the local operations of AT&T were split into seven independent regional companies (Regional Bell Operating Companies also known as "Baby Bells"), while long-distance business, as well as production of telecommunications equipment, remained under the control of AT&T.

The process of creation of the competitive market in the EU started in 1987, when the Commission of the European Communities presented the Green Paper on the Development of Common Market for telecommunications services and equipment.[36] Despite the claim of this document about promoting "the development of new services by setting them in a more competitive framework" and necessity of "the transition toward a more competitive environment," the Green Paper also explicitly contained notification about "the major importance of scale effect" in this vital area of the modern economy. However, the scale effect is precisely one of those industrial characteristics that tilt industries toward high concentration, and, thus, the statement about its importance for the development of the industry quite contradicts the claims about promotion of rivalry, if only we are not talking about creation of an oligopolistic market. Therefore, it might be inferred that the real goal was the substitution of the state-owned monopolies across the Europe by the market where only several supranational giants will play the main role on the whole territory, rather than promoting the places under the sun for small and medium-sized businesses in this field.

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[36] Towards a Dynamic European Economy, Green Paper on the development of the common market for telecommunications services and equipment. COM(87) 290, June 1987 http://ec.europa.eu/archives/information_society/avpolicy/docs/reg/tvwf/com_1987_290_en.pdf

The current situation on the European market speaks in favor of this claim: former telecom state-owned monopoly of Germany, Deutsche Telekom AG, is nowadays the major player in the fixed communication markets not only in Germany, but also in Greece (through Hellenic Telecommunications Organization S.A.), Slovakia (through Slovak Telekom), Hungary (through Magyar Telekom), Croatia (through T- Hrvatski Telekom), as well as non-EU countries Macedonia and Montenegro (through the control over Magyar Telekom who controls Makedonski Telekom AD and Crnogorski Telekom), and also one of the biggest European mobile provider with the brand T-Mobile. Swedish TeliaSonera is the major telecom company in Baltic and Scandinavian countries. Descendent of the former French monopolist, Orange Telecom, has taken control over the former Polish state-owned telecom monopoly. Big business from the most developed parts of Europe have managed to take control over the industry in many less developed territories of the continent,[37] but it does not mean that small European countries were unable to develop the industry without such aid. Recent studies show that some Central and Eastern European countries not only demonstrated a higher level of competition and the presence of small and medium-sized enterprises in the industry during the first decade of the 21st century, but also have been able to leapfrog the most advanced economies of the EU in the development of fiber-optic infrastructure (Lemstra and Melody 2014; Serdarević et al. 2016; Rood 2010).

No wonder that the idea of the abolishment of exclusive rights in the industry did not inspire all EC members. France, that heavily relied on the domestic production of telecommunications equipment and had one of the most successful pre-WWW online services in the world — Minitel — tried to stop or, at least, delay the process and protect interests of some local stakeholders of the industry.[38] Even if we assume that interests of these stakeholders did not coincide with general interests of France citizens, the Minitel project per se showed that the state-owned monopoly was also able to search ways to satisfy the needs of society in the information age (Cats-Baril and Jelassi 1994). Nowadays, when the Internet has become the vital part of our life, it is, possibly, difficult to look back without hindsight bias, but in the end of

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[37] Some scholars notice that "[t]he internationalization of EU incumbents could not have taken place without liberalization of entry regulation and would have been difficult without progress on unbundling and privatization" and that "the most international of the EU's Multinational telecoms … incumbents emerged from the larger continental economies: France, Germany, Spain and Italy" (Clifton, Díaz-Fuentes and Revuelta 2010).

[38] See ECJ, Case C-202/88 France v. Commission, [1991] ECR I-1223

the 1980s and the beginning of the 1990s, before MS Windows 95 and the start of the exponential growth of home PCs, it was a significant achievement that France Telecom provided access to various online services for about 25 million users through 9 million Minitel devices (Sayare 2012).

Some scholars point out that the global process of liberalization was pushed by the US government in the interests of the US economy (Mueller 2010), and some facts support this claim. The state-owned monopolies until the end of the 1980s controlled not only the telecommunications infrastructure and market of telecom services, but also the market of terminal equipment that could be connected to their networks; and the European decision about "liberalization" of telecommunications coincided with changes in the structure of the global ICT equipment market. The first Directive of the reform in 1988 aimed to create a common market of end-user terminals (Commission Directive 88/301/EEC of 16 May 1988). In the middle of the 1980s, the former American telecom monopolist, AT&T, launched an active campaign in the field of telecom equipment production in Europe: the company formed a joint venture with Philips Telecommunications B.V. in the Netherlands, with Telefonica in Spain (Noam 1992), acquired 25% share of Italian Olivetti S.p.A. In 1989, Italian state-owned telecom manufacturer Italtel chose AT&T as a partner for its plans to upgrade the Italian network with estimated budget of $30 billion (Hochheiser 1990; Vietor 1994). The agreement between AT&T and Italtel also called for joint development of new products, and, according to some opinions, provided AT&T the basis to be a major player in the future European telecom market (Hochheiser 1990).[39]

The communication industry from the very beginning was extremely important for economic activity. In 1971 Posner claimed that communications "are part of the 'infrastructure' of economic growth. Adequate transportation, communications ... must be in place before the development of modern industry is possible" (Posner 1971). Meanwhile, until the end of the 20th century in most parts of the world the main concept of regulatory policy was evaporation of rivalry in the industries that allegedly tend to be natural monopolies and total control over the remaining producers.

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[39] One of the articles in the Los Angeles Times on June 5, 1989 assumed that "it was an important victory for AT&T" and "it allows the U.S. giant ... improves AT&T's position for the post-1992 unified European market" (available at http://articles.latimes.com/1989-06-05/business/fi-1347_1_at-t-network-systems-international-telecommunications-market-philips-nv). Later, in 1996, the telecom equipment business unite of AT&T was separated from the parent company and renamed to Lucent Technologies. After the merge with Alcatel in 2006, the company changed the name to Alcatel-Lucent. Nowadays, this is a part of the business of Nokia.

In the last decades of the century the attitude toward the way of regulation of the telecommunications sector started to change. This alteration coincided with a changing view of the mainstream of economics and promotion of liberal ideas by many prominent scholars. Milton Friedman, for example, not only pointed that the establishment of a monopoly is a difficult task without explicit or implicit help of government (Friedman and Friedman 1990), but also concluded that "private monopoly" is "the least of the evils" in comparison with "public monopoly" or "public regulation" (Friedman 2009). If the interventionists' view could be based on any robust reasons, then this shift of regulatory policy would allow to suppose that whether the whole preceding period of regulation in this field was based on fragile theories or that the current approach is not the best from the point of view of the public interest. However, we can also conclude that regardless of a dominant theory at any particular period these theoretical propositions can be used by those who have power to implement them in public policy or, furthermore, even such dominance of a point of view in economics can be a result of interests of policymakers.

Of course, it could be also argued that this change was warranted by the technological breakthroughs in the ICT industry, but such explanation does not sound convincing,[40] especially, if we look how the problem of the shortage of supply of ordinary phone services was solved after the introduction of market mechanisms in different parts of the world.[41] Nevertheless, even the processes of "deregulation" and "privatization" in telecommunications do not prove the presence of the "public interests based" approach in regulatory policy. Captured regulation can easily take a form of "liberalization" and maintain interests of powerful groups of society, and we will return to this issue in the next chapter.

2.4. Key regulatory issues in telecommunications

It is generally assumed that the alteration of the paradigm of regulation of the telecommunications sector in Europe can be considered as a period of "deregulation" and "liberalization" of the industry, but this terminology seems quite misleading. Indeed, the state has not retreated from the telecommunications sector and has continued to play a significant role in the field, even though, it "has taken on a host

[40] The problem is analyzed in more details in Chapter 3.

[41] e.g. Armstrong and Sappington (2006) analyze the development of the industry in Chile and shows that that "liberalization" allowed to increase the number of fixed lines more than three times between 1992 and 2000. Similar picture can be found in Russian telecommunications.

of new functions ... in the new institutional arrangements" (Grande 1994). No doubt that during this period there were efforts toward creation of rivalry in the market, even if in oligopolistic form, and there was a real transformation of property rights from public to private entities, but there was also creation of new institutional environment that imposed new regulatory burdens on the new participants of the telecom business.

According to the EU regulatory framework for electronic communications there are three main objectives of regulation in this field: strengthening of competition, stimulation of investment, fostering of consumers' freedom of choice and "enable them to benefit from innovative services, quality and lower rates."[42] From the European Directives aimed to achieve these goals, we can distinguish several key aspects, that try to solve the problems that, allegedly, cannot be solved by market mechanisms: (1) strategic planning and distribution of limited resources such as radio spectrum, (2) access to network elements and associated facilities, (3) harmonization of networks, associated facilities and services through standardization and (4) control over companies that have significant market power. In addition to the efforts to achieve the main goals of the industrial policy, it is interesting to look at two other issues that also shape the regulatory activity in telecommunications and that are able significantly affect the landscape of the industry and lead to government failure: (5) national security and criminal investigations and (6) social significance of telecommunications services. All the aforementioned aspects are universal issues in the telecommunications industry not only in the EU, but also in other parts of the world, where current economic conditions are sufficient for the development of this area. Below there is an analysis of these aspects through the prisms of the theories of market and government failures.

2.4.1. Strategic planning and distribution of limited resources such as radio spectrum

The theory of market failure justifies the government activity in this area through the problem of externalities, because, according to the basic assumption, unregulated usage of radio spectrum will interfere with the usage of the same

[42] Summaries of EU legislation: Regulatory framework for electronic communications (http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:l24216a)

spectrum by others.[43] The "doctrine of spectrum scarcity" has prevailed in the regulatory activity of telecommunications from the first part of the 20th century. Nowadays this concept still plays the main role in issues devoted to the planning and distribution of radio frequencies. In 1959, Ronald Coase in his seminal article "The Federal Communication Commission" introduced the idea of tradability of radio spectrum, and since the last decades of the 20th century various countries have gradually adopted these principles in their regulatory frameworks. Coase soundly claimed that "the main reason for government regulation of the radio industry was to prevent interference" and suggested that implementation of property rights to this field would be more efficient solution of the problem (Coase 1959).

While the Coasean approach in distribution of radio spectrum expands to new geographic territories like European Union,[44] it is very important to notice that nowadays the development of radio technologies allows to make claims that the scarcity of radio spectrum is a common misconception (e.g. Staple and Werbach 2004), or that "new technologies promise to replace scarcity with abundance, dumb terminals with smart radios able to adapt to their surroundings, and government-defined licenses with flexible sharing of the airwaves" (Werbach 2004). From such a point of view the efficiency of radio spectrum exploitation can be achieved through reuse of frequencies, implementation of "smart" antennas, advanced methods of modulation and other technological improvements, and, what is very important, it does not require any limitation of the number of users of radio spectrum or strict determination of possible technologies. The radio spectrum by its nature is a common pool resource and, thus, formation of exclusive rights to the usage of this common good reasonably induces concerns from society. Lawrence Lessig (2007) compares distribution of radio spectrum through auctions with distribution of the "right to sell hotdog," and that introduces the problem in a very straightforward manner.

In general, the solution of the problem of distribution of radio spectrum is placed between two extremes. One of them is extension of property rights into the domain of radio frequencies, and, despite the common relationship between the market and property, it hardly can be considered as liberalization, because it just transforms the common property into the hands of private entities. In this case the link between the high market concentration and the market imperfection is just an

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[43] Such approach in explanation of the intervention through the concept of negative externalities can be found, for example, in Holland et al. (2015).

[44] See Decision No 243/2012/EU of the European Parliament and of the Council of 14 March 2012.

illusion caused by the fact that market mechanisms play some role after the privatization of the common resource, but since the establishment of such rules is the result of government intervention into the realm of commons and the artificial limitation of the resource that hypothetically is not so scarce, it could be argued that the competition failure is rather a government failure than the market inability to resolve the issue. Moreover, since market mechanisms play such a secondary role in the process of frequencies allocation, we cannot claim that this concentration is the result of the victory in market competition merely because such competition was not possible. This market was doomed by the state to be an oligopoly even before it was created.

As was noticed by William H. Melody (2012), in the EU "[t]he liberalisation objective of stimulating competition and opening access apparently was not considered to be the cornerstone of spectrum policy," but this is not only the case in the EU. The same approach can be found almost everywhere in the world, and everywhere in the world we observe highly concentrated landscapes of wireless telecommunications. In other words, the wireless sphere is a vivid example of government failure to adopt the policy that could bring the competitive order in the industry, while the outcome of this failure is a high level of concentration and distortion of the genuine market process. However, this approach might be considered, to some extent, as deregulation, because after the assignment of property rights, the allocation of resources toward the highest valued use could be under the guidance of market mechanisms.

The alternative is the real liberalization of radio spectrum and formation of the competitive order in the radio industry. The role of the government in such a case is to manage availability of the spectrum to everyone and prevent the interference and fraud. This approach is, possibly, more difficult in implementation. It requires thorough and comprehensive analysis of the existing technologies, monitoring of their development, creation of regulatory policy and enforcement of these rules. The failure in the achieving of the goals clearly testifies the government's inability to provide a solution without any possibility to explain it through the imperfection of market mechanisms. It is even possible that future technologies will allow us to completely open the spectrum and manage its distribution without any direct intervention of the state, in the same way as we use Wi-Fi in our home networks, but, then, this future openness should be a purpose of the current regulatory efforts. The advantages of this approach are on the surface: opportunity to establish a real competitive market; this

rivalry requires and, thus, will bring new methods of modulation, transmission and processing of radio signals; new technologies and threats of potential entry will encourage established companies to innovate and to increase the quality and number of services; it can attract investments in the area and foster rivalry not only in the telecommunications segment of ICT, but also among manufacturers of telecommunications equipment. Meanwhile, the role of government in such conditions would be still very important, but this role is not in the field of allowance to customers "to benefit from innovative services" because this task is not among the alleged problems of market failure and could be solved by the market. The regulation must still accompany the market mechanisms in the solution, for example, of ecological problems caused by the usage of radio technologies in order to protect citizens from the abuse of electromagnetic waves by the market players, or, as Lessig suggests, the government could "simply be assuring that the technologies that use the spectrum are properly certified technologies" (Lessig 2001).

2.4.2. Access to network elements and associated facilities

This aspect includes two parts, and both of them can be explained by the competition failure of the market. The first part is devoted to the necessity of interconnection of different networks, and in this case, incumbents can easily prevent potential competitors from the entry to the market. Therefore, interventions in this area might have significant value for promotion of rivalry in the industry. The Access Directive[45] makes an explicit claim that "[i]n an open and competitive market, there should be no restrictions that prevent undertakings from negotiating access and interconnection arrangements between themselves, … [while in] markets where there continue to be large differences in negotiating power between undertakings … it is appropriate to establish a framework to ensure that the market functions effectively." However, it is difficult to claim that this intervention can be explained by the market imperfection, since the "large differences in negotiating power" is an obvious result of the previous government activity in the industry. Of course, the could be reasonable doubts in the self-correcting power of market mechanisms, but it is clear that the initial conditions were entirely formed by the state and, thus, they rather point out the government failure to transform the regulatory-formed monopoly to "an open and

[45] Directive 2002/19/EC of the European Parliament and of the Council of 7 March 2002 (Access Directive).

competitive market". Moreover, the second part of the issues — the necessity to provide access to associated facilities — is even less clear and can be challenged by some suppositions.

It is necessary to bear in mind that the initial efforts to solve the problem of telecom monopolies by no means had any connection with the realm of market failure. These monopolies in European countries, as well as in the vast majority of the world countries, were state-owned companies and they had to be privatized according to the new regulatory arrangements. The significant market power of new powerful players was a direct consequence of the positions of their predecessors. Moreover, it was a direct result of the way of their privatization. The agenda of the European reform of the industry did not envisage full-scale divestiture of these monopolies before privatization. Moreover, there was a claim that the single European market will allow to benefit from economies of scale, that, according to some opinions, was not possible within the borders of one country (Koenig et al., 2002). However, the fact that small business still exists in the telecommunications industry testifies against the necessity of such supranational scope of economies of scale for the telecom development and this issue will be analyzed in details in the next chapter.

Furthermore, results of some studies show that economies of scale did not play a significant role in telecommunications, unlike economies of scope (Bloch, Madden and Savage 2001). At the same time, new entrants of the new "demonopolizing" market of Europe were not able to benefit from economies of scope due to regulatory constraints, since the process of demonopolization occurred bit by bit, service by service.[46] It took about 10 years before all services were placed in the competitive environment. Moreover, not only services but even the telecommunications infrastructure was not placed in the competitive marketplace in the beginning of such "liberalization" process, and, consequently, the potential entrants were not allowed to develop their business independently and had to rely on the accessibility of the incumbents' infrastructure and on their capability to get this access.

Competition policies, that intend to promote rivalry in highly concentrated industries, pay attention to peculiar industry features and try to facilitate competition through alleviation of their influence on entry. Asymmetric regulation (when incumbents and new entrants are regulated in different ways) or structural separation (when business of a monopolist is separated in different parts, some of

[46] In 1988 was opened the terminal equipment market, in 1990 market for "non-voice services and voice services for closed groups," in 1994 satellite services, in 1995 Cable TV, in 1996 mobile communications and from 1 January 1998 voice telephony services.

them still continue to be a monopoly, while others are forced to compete with rivals without the advantage of the monopolistic part) address the problem of monopolistic bottlenecks, such as local loops, that can be considered as essential facilities of network infrastructure (De Bijl 2005). However, this problem is a consequence of regulation and could be alleviated by radical alteration of the industry structure, elimination of the market power problem through divestiture of the giants and promotion of technological pluralism in all fields of the sector. In other words, instead of regulating the market process, promoting competition in the areas where it perceived feasible by regulators, the policy could be aimed at the discrepancy "in negotiating power" of market participants.

The existence of "monopolistic bottlenecks" is not a result of inability of the market to solve problems of this kind, but the result of the previous industrial policy. Even the technical decisions that led to the bottleneck problem had been made within the highly concentrated market environment and, often because of this, did not envisage alternatives. It might be argued that facilities-based competition is able to reduce the needs for regulation of the bottlenecks (Canoy, De Bijl and Kemp 2003) and provides more efficient outcome of the development of network infrastructure compared to service-based competition (Yoo 2014), while the latter has been the main target of the European "pro-competition" policy in the industry. The Russian case, that will be discussed in Chapter 4, where up to five broadband providers can be found in the same districts and the same buildings with their own infrastructure, questions the "doctrine of bottlenecks" in the telecom industry, and it is possible to argue that these problems are the consequences of other aspects of regulation of the industry and regulatory efforts in completely different fields. The efforts that aim at the alleviation of the problem rather than to the alteration of the industry's structure and formation of alternative institutional arrangements can provide advantages to the most powerful actors of the market, and, thus, could be rather considered as an example of government failure.

2.4.3. Harmonization of networks, associated facilities and services through standardization

It is widely believed that the market also cannot achieve efficiency due to its alleged inability to efficiently coordinate market actors, and the problem can be represented through different approaches in terms of market failures. First of all,

there is an issue of externalities, and in this case we are dealing with a particular form of this phenomenon — network externalities. In markets where the network effect is noticeable, market actors depend on decisions of other market participants and are forced to adjust their behave to the general market trends. Secondly, it can be argued that the presence of network externalities may lead to the competition failure problem (see, e.g., Farrell and Saloner 1985). The lack of standards provides opportunities to lock-in customers on a particular technology, and these costumers are not only end-users of telecommunications services, but also providers of these services. The entire business of these companies and also ability to adopt new innovative technologies can be locked-in on a particular producer of a proprietary standard. Finally, the problem may stem from information asymmetry, or, maybe in this case more appropriate would be another version of the term, the problem of incomplete information. Market actors without standardization, due to the lack of information, can choose technology, that is not interoperable with the technology that is used or is going to be adopted by other market actors, and, as a result, they will be unable to connect their networks or to provide a full range of services.

Despite the rationales for intervention described above, the regulation of this field provides many opportunities for the government to fail in achieving the socially desirable outcome. First of all, it could be a problem of QWERTY-effect, that locks the industry in a particular technology, despite the presence of better solutions. A more serious problem is if an adopted technology is not suitable for the future development, even if at the moment of adoption it showed sufficient or even better results than alternatives. The fact that the most prevalent standards of Internet access in Europe are xDSL and DOCSIS, but not FTTx (OECD 2015), is, possibly, a problem of this kind. Yoo (2014), for example, notices that due to the standardization policy of the French regulator, former monopolist Orange even in 2010 aimed to increase the ADSL coverage to 99% by 2013, while in many eastern European countries by that time a significant part of the subscribers had broadband access through fiber-optic infrastructure (Rood 2010; FTTH Council Europe 2012).

The worst situation is adoption of a standard due to the adjustment of regulation to interests of powerful groups, while it seems difficult to exclude their influence in the standard setting process.[47] For example, among the full members of European Telecommunications Standards Institute (ETSI) — the organization that

[47] It is important to notice that here are many studies on strategic behavior in standard setting. See, e.g., Shapiro and Varian 2013, Shapiro 2001a, Shapiro 2001b, Farrell et al. 2007.

determines its role in Europe as production of "standards to support European regulation and legislation which are defined in Regulations, Directives and Decisions developed by the EU"[48] — there are not only manufacturers of telecommunications equipments, but also incumbents of fixed and mobile industry such as Verizon, Vodafone, T-Mobile, TeliaSonera, Telefonica, Orange, KPN, etc.[49] In other words, the incumbents of the telecommunications business actively participate in the adoption of telecommunications standards by regulatory policy, and, since the organization is a European "recognized regional standards body",[50] may affect the adoption of a standard that is suitable for their needs.

Leaving aside the public interestedness of such policy and looking at regulation through interests of incumbents, it is possible to assume that due to the nature of this mechanism, the real purpose is control over technological development and innovation in the industry. Such interventions can be considered as protection of incumbents' investments in established technologies that could be undermined by appearance of new solutions in the market, and as an attempt to affect costs of innovative newcomers. The consequences might be expressed not only in the industry's lock-in on the inferior technology, but also in suppression of market mechanisms and contribution to concentration of resources in the market.

Moreover, this issue is again a result of government interventions in the free market process that contribute to the concentration of economic power, and in this case the interdependence of different layers of telecommunications becomes apparent. In more details the issue will be analyzed in Chapter 5, where the example of wireless industry exposes this interdependence and shows that a pluralistic landscape requires preservation of the competitive order in different layers.

2.4.4. Control over companies that have significant market power

A necessity to control monopolies was one of the first justifications of the government presence in economic activity. The mainstream economics, that has the concept of perfect competition in its core models, suggests that if industry's inherent characteristics tilt this industry toward monopoly, then Pareto efficiency will not be

[48] See explanation of the role of ETSI in Europe on the official website of the organization: http://www.etsi.org/about/what-we-are/role-in-europe

[49] For the list of members see http://www.etsi.org/membership/current-members

[50] See http://www.etsi.org/about/what-we-are

achieved and, thus, government should find ways to move the prices closer to the competitive level. As was discussed in Introduction, the economic schools that have embraced the spirit of classical liberalism have questioned concepts like perfect competition, Pareto efficiency or competitive level, which, at the same time, have often been taken into account in the antitrust analysis. The version of liberalism, that has been mainly promoted by the Chicago school, has changed the attitude of antitrust agencies to the problem of monopoly (see, e.g., Bork 1978; Posner 1979). As a result, in the light of modern legal systems of developed countries monopolies per se are not considered as targets of the policy, while some conduct of companies with significant market power may lead to antitrust liability.

The common arguments of neoclassical economists are based on the assumption that monopoly is formed by the market, and, thus, in many cases this situation could be considered the better allocation of resources from the point of view of "consumer welfare,"[51] but the broader view on the problem of "government failure" allows to look at the picture from another angle. Significant market power of telecommunications companies is very often a direct consequence of the set of previous decisions of policymakers, and it even does not matter whether the reasons for these interventions were market failures, ideology or corruption. Therefore, if positions of major players are the result of regulation, then it must be difficult to justify a passive role of the regulator in such cases of competition failure even from liberal viewpoints. However, the competition failure problem in this case is not an example of market failure, but the regulatory failure issue.

Monopolies of the ICT industry in general, and monopolies of telecommunications in particular, can be dangerous, not only in the sense of threats to "consumer welfare", but also from social and political perspectives. Since the information and communication sector is the driving force of the new economy, it is possible to infer that concentration of power in the industry leads to accumulation of wealth in the hands of the most powerful players of this field. Meanwhile, it is a

[51] Bork and Sidak (2012) point out that Chicago school helped to clarify the Supreme Court's decision in United States v. Grinnell Corp., 384 U.S. 563, 57071 (1966) that monopolization claim under Sherman Act (Section 2) requires not only possession of monopoly power, but also "the willful acquisition or maintenance of that power as distinguished from growth or development as a consequence of a superior product, business acumen, or historic accident". At the same time, it seems that it cannot be easily distinguished whether market positions are the result of business acumen or acumen in usage of legal frameworks.

widespread view in the areas of economics and social sciences that concentration of wealth can threaten our freedom and democratic principles of modern society.[52]

This situation requires revision of the purposes of competition law and elaboration of new methods and approaches in this area, but again it is very dubious whether such concepts as efficiency, competitive level or consumer welfare should form the theoretical ground for antitrust interventions. If we understand that the landscape is not an outcome of a free market system, that the growing social and economic problems of our days and the concentration of our economy is the price for the regulatory formed failure of market mechanisms, that this concentration threaten values and principles of justice and liberalism; then we have reasons to reconsider the objectives of competition policy, and the shift of its focus from the process to the structure of markets is one of the possible solutions. Instead of seeking ways to curb market power, we can make efforts to eliminate this power; and the telecommunications experience shows that this is precisely the method that have been ignored by governments everywhere in the world. Instead of breaking-up, they have chosen to control companies with significant market power, despite the fact that this power has never been an outcome of market forces.[53] The competition failure is a failure of the government to promote competitive order in the industry, and the only way to revive the genuine market process is to change the structure of the markets.

2.4.5. National security and criminal investigations

The significant role of telecommunications industry in our life warrants its importance in issues of national defense and criminal investigations. Military departments use their own telecommunications systems and often any interference with civil services must be excluded. It explains why some parts of radio spectrum are closed for civil usage. Another important part of this aspect is the necessity of implementation of phone and computer surveillance for purposes of criminal investigations, intelligence gathering, prevention of crime, protection of citizens,

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[52] For the problem of economic power concentration see, e.g., Eucken (1995) and other viewpoints highlighted in Introduction. See also Acemoglu et al. (2013), Murphy (2015), Holcombe (2015).

[53] See also the analysis of John Burton (1997), when he argues that "[t]he privatization of major previously state-owned utility monopolies … involves a scenario of a quite different origin [than is envisaged by the Austrian school]. The market power of such organizations has not arisen due to their market prowess, but instead because of government ownership and protection."

objects, etc. The theory of market failure explains government presence in this activity through the concept of public goods.[54]

At the same time, solutions of these tasks also contribute to the issue of concentration of resources and power in the industry. Actual needs of military services in radio frequencies are, usually, hidden from the public control, while information about future availability of the radio spectrum for civil use affects the strategic planning of manufacturers of telecommunications equipment and wireless services providers. Those enterprises, that have strong ties with military authorities have more opportunities to affect the process of decision making, get access to the information and benefit from this advantage. In this sense, it is interesting to note that such companies as Vodafone or VEON (formerly VimpelCom), that currently are among the world leaders of mobile services, started their businesses on the basis of Racal Electronics plc. and Academic Mintz Radiotechnical Institute respectively, that were among the largest makers of military radio technology in their countries.[55]

The obligation of telecommunications companies to arrange systems of phone and computer surveillance on their networks has impact on economies of scale and, thus, provides advantages for the big business. The percentage of these expenses in the total costs of a big company can be close to zero, while for a small enterprise the figure could be very significant. In some countries, telecommunications companies must not only purchase and install these surveillance systems on the nodes of their networks, but are also obliged to organize a communication channel to a communication center of the security agency without any reimbursement of the expenses.[56] Such obligation can easily undermine opportunity for the business activity of a small company, clearing, thereby, the space for big enterprises.

Even if we accept that solutions of these issues actually require presence of the government in the industry, we also have to acknowledge that it distorts the market process and negatively affects the industry's performance. Since the growing size of companies in such circumstances is a natural response of the distorted market forces to the intervention, looking at the modern problems of power concentration we again

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[54] Stiglitz (1988) points out that "national defense" is "an example of a large scale" of "pure public goods," and that such goods "either will not be supplied by the market or, if supplied, will be supplied in insufficient quantity."

[55] For example, according to Press Note N. 86/613 of the Department of Trade and Industry of the UK of 28.08.1996, there was a decision to increase "the number of radio frequencies available for use by cellular radio in London … currently allocated to the Ministry of Defence." One of two beneficiaries was Racal-Vodafone.

[56] See Order 130 of 25.07.2000 of the Ministry of Communications of Russia.

enter the domain of regulatory failure. The inevitability of the presence of the state in our life for solutions of many non-market issues requires mitigation of negative effects from the interventions, and, thus, institutional frameworks that aim at prevention of market concentration are one of the reasonable methods to dealing with the problem.

2.4.6. The social significance of telecommunications services

The unchallenged importance of ICT for the modern world gives birth to ideas that significantly affect the regulatory policy of this field. Even in the realm of human rights, nowadays we can find the idea that human beings have a right to Internet access and they should not be discriminated in this right.[57] The policymakers of many countries eagerly try to incorporate this idea into the efforts of subsidization of the development of telecom infrastructure. However, even the presence of the problem of digital divide in the second decade of the 21st century in developed parts of the world is able to raise reasonable questions about the real sources of this issue.

Meanwhile, "direct subsidy of money", according to Stigler (1971), is "the most obvious contribution that a group may seek of the government." The shortage of competition increases deadweight loss and is expressed in the shortage of supply in the market. As we analyzed above, the shortage of competition is not only a result of government failings in solution of the task of promotion of rivalry, but also a consequence of regulatory policy in other fields, such as radio spectrum distribution, national defense or even necessity to maintain harmonization, integrity and security of networks. The ideas that freeing up of some parts of the radio spectrum would allow to solve the problem of provision of telecommunications services in rural areas could be met in academic literature since the beginning of the 2000s (Compaine 2003; Wanichkorn and Sirbu 2002), but instead, "emphasis on bringing broadband to low density areas continues to look at the cost of "wiring" " (Compaine 2003).

Another idea that prevails in the regulatory efforts in this aspect is the equalization of inhabitants of urban and rural areas. Numerous "digital agenda" plans of various countries include not only the necessity of provisioning the access to modern information services, but also impose minimal requirements to these services (OECD 2015), that can be understood as a mechanism of "control over entry".

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[57] One of wikipedia articles is even dedicated to this issue https://en.wikipedia.org/wiki/Right_to_Internet_access

Indeed, if the problem of Internet access in some particular village can be solved with implementation of a particular radio technology, the requirements of provision of speeds equal or over, for example, 30 or 100 Mbit/s can deter alternative players to enter the market.[58] Moreover, it is even not clear that broadband access with different characteristics can be considered as a part of the problem of digital divide. People cannot afford to have the same cars or to eat in the same restaurants, and, if a person cannot afford to have an Internet connection that allows to watch YouTube 24 hours every day, than why not consider it as a problem of this kind?

It is necessary to notice that some scholars are quite skeptical about the concept of "digital divide."[59] A reasonable note is that "when it came to gaps related to technology, they tend to be relatively transient" (Compaine 2001). Indeed, many technologies, that from the beginning could be considered as luxury goods, such as cars, television or air transportation, after a while became ubiquitous and affordable for the masses. Nowadays, access to advanced ICT technologies becomes more and more feasible for various strata of society, and this is rather a result of the increasing demand and technological development, than an outcome of government interventions in this field.

It can be argued that nowadays basic telecommunications services are comparatively cheap and they could be even cheaper if markets would be more competitive, while direct public investment in the development of the industry creates advantages for those who get it, and, thus, negatively affects rivalry. Even if we drop out suspicions of regulatory capture in this particular case, and imagine that the real efforts of policymakers to cope with the problem of digital divide do not incorporate interests of some industry players, this activity per se has great chances, albeit unintentionally, to affect the industry's landscape providing advantages for those who benefit from these subsidization and worsening positions of companies that bear the burdens of such rules and unwillingly invest into the development of their rivals.[60]

Digital divide is not the only idea that dominates regulation of the ICT industry in general and telecommunications in particular. The recent adoption of the "roam like at home" rule in the EU has induced reasonable criticism from the

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[58] See, e.g., efforts of the government of Sweden that established plans to guarantee access at a minimum speed 100 MBit/s for at least 90% households and businesses by 2020 (OECD 2015). See also the analysis of the public support of infrastructure development in the next chapter.

[59] Some examples can be found in Compaine (2001).

[60] It has become common in very different world countries to form the Universal Service Fund at the expense of industry players (e.g. in the USA, Nigeria, Afghanistan, India, France, Italy, Russia, etc (according to GSMA (2013)).

academic community.[61] This is by far not clear that the European idea of "bringing people together" has in fact been expressed in the "one of the greatest and most tangible successes of the EU."[62] Quite the contrary, this endeavor has raised new and very immense barriers toward the possible formation of the competitive order in the industry. The problem is not only that this approach establishes an unjust scheme of payments among subscribers of mobile services, making "those who frequently travel in the European Union … the winners and those who do not … the losers" (Peitz 2017). Another side of this rule is that this scheme is manageable only within the current institutional arrangements where several giants dominate the mobile market of the entire continent, and the maintenance of this scheme requires extensive regulatory efforts.[63] In other words, this approach is sustainable only within the ordered competition regime, while in a hypothetical alternative market that is driven by market forces and where no one has enough power to affect behavior of other market actors, the difference in bundling offers as well as in business decisions in the wholesale markets are the tools of the competitive process.

2.5. Summary and conclusion for Chapter 2

The market failure explanation of interventions in telecommunications markets is mainly concentrated among such issues as competition failure, information asymmetry, provision of public goods and a necessity to solve the problem of externalities. The current analysis of the main regulatory frameworks of the telecommunications industry allows to argue that, firstly, there are sound reasons to challenge the interventionists' arguments that are based on the market failure approach, because in many of the cases the failures are rather consequences of government imperfections than market mechanisms. Secondly, even when some rationalities for interventions, such as in the case of national defense, can be acceptable, we have to bear in mind that these interventions distort the genuine market process, and, thereby, again lead to government failures that can be expressed in the shortage of supply and deadweight losses. And thirdly, there are cases where

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[61] See, e.g., Peitz (2017).

[62] European Commission - Statement "End of roaming charges in the EU: Joint statement by 3 EU institutions," Brussels, 14 June 2017. Available at http://europa.eu/rapid/press-release_STATEMENT-17-1590_en.htm

[63] There are reasonable notes that international mobile roaming "prices tend to be high in the absence of regulation" (Petropoulos and Marcus 2016), but this observation is relevant to the current system where the government has prevented formation of a pluralistic landscape in the mobile business.

delineation of market and government failures is quite complicated, because if we look at the issues from the Austrian perspectives and accept that the task of the government is to define and enforce property rights, then we merely have no ground for the market failure concept even in the issues of externalities; and the telecommunications experience allows to take this position.

The current way of development of telecommunications is a result of previous policy decisions in this field, and the dominance of supranational companies in the world market is a consequence of regulatory efforts rather than inherent industry's characteristics. Concentrated power in the telecommunications sector form the very beginning has been a product of the government activity. Therefore, the competition failure ground for interventions directly points at the failure of the government to form the competitive order in the industry. Nowadays, the market failure justifications shape the policy in many fields, such as maintenance of access to network facilities, integrity and security of networks and services, harmonization of networks, etc., but there is no evidence that the market, when it works properly, is unable to achieve socially desirable outcomes in solution of these problems. However, these interventions are justified because the market does not work properly, and this is because of the government's refusal to establish the free market order in the industry and the government decision to preserve the concentrated heritage of the previous years of suppression of competitive forces.

Meanwhile, this regulatory activity is highly beneficial for the major industry players, for whom the state protection of the existing status quo is the main guarantee for preservation of their rents. About any aspect of regulation allows to find ways to provide opportunities for some groups of the industry and stifle activity of others. Self-interested policymakers have favorable opportunities to explain their decisions through the needs of maintenance of digital economy, solution of social problems, interests of national defense or harmonization of networks. These efforts not only allow the giants to control the industry's development and extend their networks with the aid of public subsidies; they are eventually expressed in a number of social problems that are an inevitable outcome of concentrated power and wealth in society.

Instead of being aimed at formation of institutional frameworks favorable for efficient work of market mechanisms, contemporary regulation of the industry went far beyond the borders of the market failure concept. Nowadays, it has incorporated various ideas — from equal opportunities in access to information resources to

"bringing people together" —, and connections of these ideas with the market failure concept are not obvious even from the mainstream point of view. These interventions cement the ordered competition regime and raise new barriers for an open and competitive form of the industry.

At the same time, the tasks for the state in the present conditions are enormous even if the aim of formation of the competitive order will be adopted by the policy. One of the main of them is elaboration of competition policy that will be based on structural remedies for consequences of government failings. This policy has to take into account not only outcomes of previous interventions, but also the problem of inevitability of the state-industry interactions in provision of some kinds of public goods.

The government must ensure that all market participants have equal access to the common resources. If modern technology allows to use radio waves in an open regime, then utilitarian justifications for private property in this domain have no ground. On the one hand, this claim is, to some extent, in contradiction with the Austrian view that mainly links the property phenomenon with the private domain. However, on the other hand, justifications for assignment of property rights for radio waves are not robust even from the Austrian perspectives, where Hayek's (1973) claims about equal rules of the game (especially if we take into account advancements of wireless technology) speak rather against formation of any privileges in this sphere. In general, this issue is not only about the radio spectrum, but about all those spheres where implementation of property rights is unjust or unreasonable or where resources are controlled by the state.

The subsequent parts of the monograph continue the discussion and provide substantial theoretical and empirical support for the claims of the present chapter. They describe the alternative to the widely adopted regulatory regime of the industry and show that the competitive order in the industry is not only possible, but that there are sound reasons to suggest that the competitive order is able to satisfy the actual needs of society better than the ordered competition system. They show that the telecommunications industry is not necessarily the business of big corporations, that try to convince the policy makers that rivalry in this area can endanger "the long-term health of the ... digital economy" (Vodafone 2015). This industry is able to give opportunities for small enterprises to invade the market and to enable consumers to benefit from innovative activity of these companies, for whom only flexibility and innovation provide possibilities to survive in the competitive environment.

CHAPTER 3

Intersection of Public and Private Interests in Regulatory Policy of Telecommunications

"... the ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood. ... I am sure that the power of vested interests is vastly exaggerated compared with the gradual encroachment of ideas."

J.M.Keynes (1936), The General Theory of Employment, Interest, and Money.

3.1. Introduction to Chapter 3

The nature of state interventions into the economy might have different explanations, and two opposite extremes are public and private interests. When the interventions are justified by the public interest, we usually see arguments about the necessity to cope with the problem of market failure, and, thus, the interference into imperfect mechanisms of the market aims to increase efficiency of the economy.[64] Sometimes the arguments take a form of appeals for social justice, humanism, safety and security and other concerns that are not directly connected to the efficiency problem, but that are supported by theories and concepts from political philosophy and social sciences (see, e.g. Stiglitz 1988). Public choice theory, developed in the

[64] For the classical argumentation see, e.g., Arrow (1970), Shubik (1970), Baumol (1965).

1960s, has promoted the opposite view at public policy and underlined that the main driving force of political decision making processes is private interests of individuals.

Since the time of appearance of this public and private interest separation in the economics mainstream,[65] many scholars have tried to analyze various economic problems from these contrasting perspectives (see, e.g., Horwitz 1982; Laffont and Tirole 1991; Djankov et al. 2001). The present chapter is an attempt to contribute to this scholarship and to apply these opposite views to telecommunications markets, that have been heavily regulated since the beginning of the 20th century in all parts of the world. The results of these regulatory efforts were monopolistic markets, that later have been transformed to oligopolistic forms despite the proclaimed objectives of promotion of competition. This high level of market concentration in the industry and the empirical evidence that show that the industry is able to have a competitive form with a number of small and medium-sized enterprises in the field induce the question about which kind of interests, public or private, have prevailed in the regulatory policy of telecommunications markets. This chapter examines alternatives that could be adopted by the regulators, arguing that these alternatives also fit the concept of the public interest, and analyzes why this choice has not been made.

The chapter begins with an introduction to the theoretical framework and a brief review of the public interest and public choice theories and concepts. The following section is dedicated to the universal service concept, which played a historical role in the eventual monopolization of the industry in the US, analyzes different meanings of the concept in different periods and pays a particular attention to the augmentation of the concept by the digital divide idea that raises new questions from the perspectives of social and private interests. After that, the chapter examines the reform of the industry, that occurred all across the world and that is traditionally considered as liberalization, and argues that, although the objectives of the reform indeed represent the public interest view, there are several questions that are better answered by the public choice approach. The final section tackles with contemporary efforts of policymakers to spur development of telecommunications infrastructure. It argues that the alternative to public subsidization of the private means of production could be opening the publicly subsidized infrastructure, and even if the public interest demands public participation in the network development,

[65] One the one hand, public choice theory is not entirely a part of the mainstream, but, on the other hand, among those who developed and contributed to this scholarship there are many Nobel Prize winners (Buchanan, Stigler, Tirole, Becker, Smith, Ostrom) and that allows to argue that the theory might be considered as one of the mainstream approaches.

there are simple and reasonable methods to use this support in a pro-competitive way without allocating control over the subsidizing assets to private entities.

3.2. Theoretical framework

3.2.1. The public interest concept

The idea of the public interest has been perfectly presented by Abraham Lincoln's vision of "government of the people, by the people, for the people" and since the seminal work of Arthur Cecil Pigou, "Economics of Welfare" (1920), has been embraced by the mainstream of economics as a response to the issue of market failures. The understanding that the market does not provide perfect solutions for a number of economic problems and that such imperfectness requires corrective interventions in the market performance has allowed to consider the government as a benevolent maximizer of social welfare (Laffont and Tirole 1991).

In addition to the market failure as a reason to intervene, there are also public interest theories that take into account non-"welfare maximization" objectives, such as public interest redistribution of resources to the poor or the disadvantaged, reduction of social subordination, obligations owed to future generations, protection of animals and wild nature (Sunstein 1993), etc.. This diversity of reasons for interventions in the market allows to classify the public interest concept in different ways (Morgan and Yeung 2007; Alexander 2002; Pal, Maxwell and Lussier 2004). The public interest might be considered as an opinion of a majority (Cox 1973), as a balance or compromise between different parties (Dahl 1956), as a set of common interests shared by all social members,[66] as a sum of private interests of the community members,[67] and so on. However, the lack of universal perception of what constitutes the public interest poses a major problem in the application of the concept.

Regardless of a theory that uses the public interest claim, and even in those cases when the concept is assumed as something granted for the analysis, it is crucial to keep in mind that the idea of the public interest is one of the most questionable, fragile and vague concepts that overwhelm economic theory. There are no tools that

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[66] See the discussion, e.g., in Pal, Maxwell and Lussier (2004).

[67] In works of Jeremy Bentham we can find: "The interest of the community then is, what? — The sum of the interests of the several members who compose it" (Bentham 1996).

would allow to measure this phenomenon or that would provide robust explanation what the public interest stands for. There is no agreement, and, possibly, there cannot be agreement, about what is good and what is bad for our society, and, even if this desirability could be established, what are the best methods to achieve the desired outcomes. The concept has been vigorously criticized by many prominent pundits, economists and philosophers, because many of them have seen the public interest as simply "a rhetorical device that people use to persuade other people that they should agree to some policy they themselves favor."[68]

The statement that public interest actions should be designed to maximize freedom and justice, to protect human rights and democracy might be accepted by totally different schools of various branches of social sciences, but again we all have different perception of justice, human rights, and even the concepts of liberty and democracy often contradict each other. Some theories are trying to tie the idea of the public interest with morality and ethical norms and claim that it "may be presumed to be what men would choose if they saw clearly, thought rationally, acted disinterestedly and benevolently" (Lippman 1955). However, even disinterested and benevolent actions of human beings, their clear and rational views do not signify that their perception of the public interest would be the same. Otherwise, it is possible to agree with an argument that "any substantive conception of the public interest … [is] simply the first step on the road to totalitarianism" (Horwitz 1982).

Despite of this criticism, the public interest concept is a necessary tool for justification of political decisions and government actions, and cannot be avoided by society. Even the assertion of scholars, such as Hayek (1976), that social justice is a meaningless term, that the role of the state is not to provide remedies for market failures and not to establish any goals for social and economic activity such as welfare maximization or efficiency, but to establish rules of just conduct and to allow "spontaneous order" to put everything on the proper places (Hayek 1973, 1976, 1988), in order to be accepted requires vigorous justification that might be provided only through the position of the public interest.

In any case, the public interest assumes a choice between different alternatives, and even if we suppose that in some ideal situations the policymaking process is not affected by rent-seeking behavior, lobbyism, bribery and other forms of corruption, i.e. the process might be analyzed through the lens of public interest theory, the

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[68] See an analysis of views of Karl Popper and Friedrich Hayek on the public interest in Notturno (2014).

policymakers still cannot be free from their own beliefs, epistemological limitations and their own understanding of which alternative is better suited for social needs. As a result, the public interest might be considered as an outcome of a system based on the spontaneous order concept, i.e. a system that does not envisage achievement of any aims at all and, thus, does not incorporate not only private interests, but that is also not affected by any subjective views and biases.

Therefore, the ideal socio-economic order from public interest positions might be presented in totally different forms, and the spectrum varies from an open and free-market laissez-faire system to a system of planned economy. In the former case, any government interventions into the economy are merely actions against the public interest, while the latter example does not leave any place for market forces.[69]

The ambiguity and vagueness of the public interest perception is not the only weakness of the concept. The explanatory power of the concept is mainly focused around reasons and objectives of regulation, while the chosen ways of the achievement of the goals very often remain without convincing answers. The concept is unable to explain why the particular aims or methods of their achievement have been adopted when alternatives could also be sufficiently supported by the public interest argumentation, and this gap has been filled up by public choice theory.

3.2.2. The public choice view

The alternative to the public interest view on regulation is an understanding that in the real world, in contrast to the idealistic models, all economic actors have their own personal interests and make their decisions with these private interests in mind. Public choice theory, being one of those endeavors in modern economics promoting an alternative to the public interest view on the political decision making process, claims that the government rather than to be "of, by and for the people", is merely an instrument in the hands of some people (Tullock, Seldon and Brady 2002).

Buchanan and Tullock (1999), who are among the founders of public choice theory, comparing the pursuit of the public interest with searching for the holy grail, reject the usage of the concept apart from "the separate interests of the individual

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[69] In the Soviet system, the idea of the public interest in different forms was in the core part of the policy. One of the Decrees of the Soviet Government (435 of 19.04.1957) stated that "the capitalists will never understand the soul of the soviet citizen … for whom the purpose of life is not the personal enrichment but the commonweal".

participants" as meaningful and suggest that the public interest is never defined. They notice that, possibly, "the clearest answer" to the issue is that "there is no public interest in the sense of being an interest of the whole public. There are only particular interests."

Public choice theory had not appeared in the vacuum and has not been the only view that emphasizes the role of private interests in political decision making process. The similar understanding that government might act as a maximizer of private interests of particular individuals might be found in the Austrian school (see, e.g., Rothbard 2006, 2009; Mises 1998), Marxism (see, e.g., Perelman 2000, 2003), new institutionalism (see, e.g., North 1994; Acemoglu and Robinson 2012), and other schools of social sciences, but the main distinctive feature of public choice and accompanying theories is an attempt to implement the tools of economic analysis to the political decision making process (Tullock, Seldon and Brady 2002).

Croley (2008), describing the public choice theory of regulation, points out that this approach analogizes regulatory decision making to market decision making in a particular market where actors exchange "regulatory goods," such as subsidies, entry barriers, price regulation, etc. The demand side of this market is fueled by private economic interests of citizens and entrepreneurs, while on the supply side private economic interests of politicians are augmented by their private political interests. Taking into account that organized groups and powerful business entities have significantly higher lobbying opportunities and incentives to influence regulation than individual voters (see, e.g., Buchanan and Tullock 1999; Tullock, Seldon and Brady 2002; Olson 1965), regulatory decisions often have an "all-or-nothing" form, and, that they are permanent and have a scope that extends across all the affected territory, it should be noted that there is a crucial difference between regulatory decisions and market decisions. As a result, public choice emphasizes that "the regulatory market works … to the advantage of organized groups with narrow interests" (Croley 2008), rather than to the society as a whole.

Generally speaking, public choice is not an alternative to the public interest concept, especially if we take the point of view such as of Richard Posner that the public interest doctrine is not an economic theory at all.[70] The public choice approach does not exclude the idea that the government might act in the interests of society, but underlines that the government consists of individuals that have their own personal interests. These personal interests of politicians and bureaucrats for some

[70] Posner (1980) notices that "public-interest theory is a description, rather than an economic theory".

reasons and in some circumstances, may coincide with common public needs, and even when they are different, democracy provides some tools to affect the decision-making process. However, being no more efficient than free market mechanisms, democracy does not provide sufficient protection from incorporation of private interests in regulation and is even often used for their achievement.

As well as the public interest approach, public choice is not without drawbacks. Being one of the economic theories, public choice mainly perceives private interests in economic terms and faces difficulties in analyzing cases when actors have altruistic, unselfish or public-spirited behavior. However, the major problem of private interest theories is that we hardly know anything about real interests of analyzed actors, about their psychological features and moral principles and, what is possibly even more important, about their actual relationships with other actors of the markets of "regulatory goods". The result of it is that even when we have all reasons to argue that some particular decision has been affected by particular private interests, it still might be a case where the policymakers had other objectives in their minds or that this is a case of other private interests interactions than we assume in the analysis.

For example, when Janson and Yoo (2013) describe decisions of the U.S. Postmaster General, Albert Burleson, whose actions, according to their opinion, were the main driving forces in the monopolization of the telecommunications industry in the United States one hundred years ago, they mainly take the side of the public interest view, implementing such expressions as "Burleson had a fixed set of beliefs about the importance of consolidation". But how can anyone know nowadays what were actual beliefs of the official that consolidated the significant assets of the industry in the hands of a single company? Since his actions were highly beneficial for shareholders of this company, it is reasonable to assume that such "beliefs" could have a substantial economic support, and that is precisely the public choice view on the problem. However, without robust evidence of such support it might be risky to make such claims and, therefore, the public interest view sometimes allows to bypass the limitation of public choice, while drawing the similar conclusions that "government actors … were movers in curtailing competition".

Researchers that look at regulation from private interest positions might easily face counterarguments that they attribute hidden motivations to policymakers without sufficient evidence. At the same time, those who take the public interest as the foundation of political decisions for granted do not need to provide any support for their starting point. However, our daily experience and common sense claim in

favor of the former position even if this position cannot be proven beyond reasonable doubt. It is even possible to say that the public choice analysis departs from the point that "knowledge of some principles easily compensates the lack of knowledge of some facts,"[71] while idealistic principles that underline the public interest view contradict the facts that we know about the nature of human beings, and, thus, even insufficient support of public choice claims does not make public interest conclusions more relevant to the real world.

In contrast to the public interest view, the power of public choice to serve as a guide in public policy is severely limited, and mainly might be expressed in appeals to deregulation due to the general pessimistic views of private interest theories about possibilities to promote collective welfare through interventions into market mechanisms. However, it should be noticed again that adoption of such policy as well as a choice of the ways of deregulation cannot be done without public interest argumentation, which inevitably leads to incorporation of private interests in the deregulatory move and that requires the tools of public choice in order to find out why the particular choice has been made.

3.3. Universal service and digital divide

3.3.1. The lesson from the early days

The main focus of this chapter is on intersection of private and public interests in the telecommunications industry, and the first step in this analysis is a glance at the early days of the industry development in the US. This story is closely intertwined with appearance of the universal service concept that nowadays has found its reincarnation in the digital divide idea. The most interesting fact of universal service is that its initial meaning was very different from what we understand now when we use this concept. The story shows that the public interest doctrine has been able to substitute even the core justifications for the intervention and to adjust them to the changing interests of industry leaders.

[71] the phrase is usually attributed to Claude Helvétius, a French philosopher of the 18th century.

The modern understanding of universal service is the service everywhere for everyone and for affordable price.[72] It has clear rationales from the positions of the public interest, regardless the precise meaning of the term, since it solves important issues of equity, social justice, inclusiveness and so on, and, at the same time, it is justified by the strong belief that the market is not able to solve these problems, i.e. there is a problem of market failure. However, the historical circumstances that gave birth to the notion of universal service contradict this modern understanding, and explicitly show that the market was better suitable to provide solutions for the network expansion, affordability of the services and services provision in rural areas.

Mueller (2013), debunking "the prevailing mythology," argues that the universal service concept in its contemporary view was not and could not be in the policy discourse that preceded the consolidation of the US telecommunications industry. The appearance of alternative players, after the fourteen years of Bell monopoly, that jointly by 1907 had accumulated more than a half of the market share, spurred the development of the industry, reduced rates, extended the network in rural areas and resulted in the penetration level in the first two decades of the 20th century that many European countries had not been able to achieve by 1970s-1980s.[73] However, the network did not have a homogenous structure and many territories experienced "dual service" competition,[74] where two parallel telephone networks competed without interconnection, and expansion was a necessary endeavor for the competitors because such strategy allowed them to increase the value of their networks, and, thereby, to obtain a competitive advantage.

For the business interests of the former monopolist, such competition was fairly destructive, because it forced the company not only to reduce rates, but also to invest in network development, to innovate,[75] to be more efficient and to share the market surplus with the competitors. The problem was aggravated by substantial

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[72] For example, the EU regulatory framework for electronic communications networks and services (Directive 2002/21/EC) defines Universal Service as "the minimum set of services, … which is available to all users regardless of their geographical location and … at an affordable price".

[73] Mueller argues, that by the mid-1920s the household penetration in the US was about 30% (Mueller 2013, p. 145), while, for example, in Western Germany the similar figures had been achieved only by the beginning of the 1970s (Noam 1992, pp. 77-78).

[74] The penetration rate in the places with fierce competition even exceeded 50% of households (Mueller 2013, p. 145).

[75] It is interesting to notice that rivals of AT&T in many places had better networks and used more advanced technological solutions (Janson and Yoo 2013; Mueller 2013)

diseconomies of scale of the telephone business[76] — the growing number of subscribers increased the average cost and, since the rates were under competitive pressure, this lowered profitability of the business. The consolidation of the network in the hands of a single company would allow to solve all of these issues at once, and eventual monopolization in fact resulted in a significant increase of the rates (Janson and Yoo 2013; Mueller 2013), slowdown of the network development (Mueller 2013) and elimination of the necessity to share the profits with independent rivals.

Since the formed monopolistic structure of the US industry was not an outcome of market forces, but of deliberate government policy expressed in relaxation of the antitrust regulation and even direct encouragement of consolidation through various mechanisms (Janson and Yoo 2013), such policy required justification from the position of the public interest. The universal service concept, promoted by Theodore Vail, provided the basis for this argumentation. Universal service was an alternative to the "dual service" regime, where the lack of interconnection often precluded connections between subscribers of competing networks. Universal service promised to resolve this inconvenience. Moreover, there were claims that the industry only in the form of an integrated monopoly is able to "realize the telephone's potential".[77] There was also a strong belief that a regulated monopoly would work more efficiently than an unregulated marketplace, allowing to avoid "the economic loss occasioned by duplication of plant and force,"[78] and, thus, taken under the government control rates would be fairer and would better fit the social needs.

The outcome of the policy and of the "stunning strategic action" of Theodore Vail was the establishment of "one of the most prominent corporations in the world for much of the 20th century" (Grove 2003). But whose interests did prevail in the decision: the "public" or the stakeholders of the "corporation"? One might argue that this is a case where the public interest coincided with the interests of the corporation, but, it also can be counter-argued that a monopoly always results in deadweight loss for society and monopoly profits for the owners of the monopoly.[79] Unfortunately, it is impossible to conduct an experiment and to see what kind of network and what level

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[76] Such prominent economist as J. M. Clark (1923) argued that "Telephone companies ... show no signs of economy with increased size, but rather the opposite" (as quoted in Thierer 1994). See the explanation of the phenomenon in Mueller (1989).

[77] AT&T Annual Reports 1907-1914 as cited in Mueller (2013).

[78] 56 CONG.REC. 8717 (1918) as cited by Janson and Yoo (2013).

[79] In the same way as Adam D. Thierer (1994) points out that it was "the one-way ticket, not only to universal service, but also to monopoly profits".

of technology development could be achieved if the policy took other views on the public interest, such as, for example, the necessity of strong antitrust regulation and return to an economy dominated by small enterprises,[80] but another policy would have also inevitably reflected in alternative ways of wealth distribution and performance of the entire economy. The important lesson from the early days of the industry is that the market was better than the government suited for promotion of innovations, development of networks in rural areas[81] and affordability of the prices, while the role of the government was still very important in preservation of a competitive landscape of the market. Moreover, even universal service objectives as an alternative to dual service competition could be achieved through the promotion of interconnection, rather than through consolidation.[82]

3.3.2. Separation of services and cross-subsidization

The public interest regulation of rates has always rested on the idea to move monopolistic prices closer to the competitive level in order to reduce deadweight loss caused by the concentrated structure of the industry, i.e. to provide remedies for the market failure problem in the sense as the mainstream understands this issue. However, again from the public interest view, there is an alternative solution of the problem, and this alternative is alteration of the market structure, fostering rivalry in the field and protection of the pluralistic form not only of a particular market, but also of markets of substitutes.

The telecommunications industry all across the world during the major part of the 20th century was perceived as a natural monopoly, and, thus, the alternative "regulation by the market" approach was deemed as either unfeasible or unreasonable. However, it is easy to infer from the etymology of the combination of words "natural monopoly" that the landscape of some industries tends to be highly concentrated as a natural outcome of market forces. That means that the entire production in the markets that have natural monopoly characteristics is able to be concentrated under the control of single producers without any regulatory protection of the positions of such monopolies and any prohibition for others to enter these markets. Obviously, that was not the case of telecommunications, where states

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[80] This view also existed in the policy discourse at that moment. See, e.g., Brandeis (1914).

[81] The US industry is not the only example. See also Noam (1992).

[82] See, e.g., the case of Wisconsin State in Janson and Yoo (2013, pp. 1024-1025).

prohibited competition and protected the monopolistic structure of the industry from any external threats, including the markets of substitutes.[83]

One of the public interest dominants of such policy was based on the formula of cross-subsidization of the services, what according to Mueller (2013) had led to the modern understanding of the "universal service" concept. It is usually assumed that the cost of services provision in highly dense urban areas are lower than the cost of network operation in rural zones, and, therefore, it is suggested that high profits obtained from the services in cities might subsidize the "unprofitable" business in villages and sparely inhabited areas. Another source of cross-subsidization is the different groups of subscribers — business and households —, and that gave an idea that not only rates for them might be different, but that also services used mainly by the business part should be more profitable for a monopoly than the services for households. This point of view had formed the approach, according to which profitability of long-distance phone calls should be higher than profitability of local services.

Introduction of competition in the telecommunications markets raised the question of cross-subsidization from the services that are provided by newcomers. It is supposed that newcomers enter only commercially interesting territories, while burdens of the services provision in other places are entirely on the shoulders of incumbents, and, since this part of business has been conceived as unprofitable endeavor based on the social obligations of a regulated monopoly, then the entrants have to compensate this activity and share the social obligations through Universal Service Funds (USF).

In other words, universal service in its modern understanding is a principle according to which some users of the network must pay for the services that are consumed by others, and when this mechanism works within a single organization it might be governed through the price regulation, but when the marketplace is opened for more than one service provider, it induces the question about competitive advantages of those whose prices are not regulated. If, as it was noted above, the public interest requires the provision of the services for prices that are lower than the costs, then different ways of achieving such goals might be chosen, and they vary from redistribution of the part of the revenues of some service providers to their

[83] See the analysis of the myth about natural monopoly in telecommunications in DiLorenzo (1996).

rivals[84] to the direct state aid that can be organized without mandatory contribution of other market participants. There could also be an option where providing universal service remains the obligation of the incumbent without any participation of independent service providers, or when small enterprises are exempted from the rule.[85]

3.3.3. The growth of information society and the changing nature of universal service

The development of information and communication technology and the proliferation of a number of theories that emphasize the role of information in the new social and economic order have allowed to augment the universal service concept by the idea that all members of modern society should have equal opportunities of access to global information networks, and, thus, the contemporary presence of any inequality of such kind has been widely perceived as a market failure. Since the market failure justification has a long tradition of trying to explain a necessity of government interventions in the economy and since inequality of access to the vital resources is generally considered as a morally wrong situation, the digital divide idea has been embraced by governments and even international institutions almost everywhere in the world.

An additional argument for the provision of access to digital services to a wide range of social strata comes from the governmental services per se that have been transformed to the online sphere. If there could be some doubts whether the society should pay for those who want to watch video online and use social networks for their own enjoyment, the necessity of providing access for everyone to e-Government, e-Learning or remote healthcare services seems obvious for many; this is seen as a domain where government must act and must find a solution.

Moreover, the idea that ubiquitous broadband access is essential for the health of our economy has been taken for granted not only by politicians, but also by a vast majority of academic society. Since the beginning of the transition towards the new economy, the vital role of telecommunications has been expressively underlined by

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[84] The case, for example, of the Russian Federation, where only the former soviet monopoly benefits from the USF when all telecommunication companies are obliged to pay for the fund (See Federal Law "About Communications" of Russian Federation of 07.07.2003 N 126-FZ and Decision of the Government of the Russian Federation of 26.03.2014 N 437-p).

[85] See the examples in GSMA (2013)

many researchers. The claims that "the diffusion of broadband infrastructure and services provides substantial economic benefits and represents an important driver of economic growth" (Gruber, Hätönen and Koutroumpis 2014) have been supported by a number of empirical studies, and have become common arguments in favor of government subsidization and other interventions. Some scholars have found causation between development of telecommunications, economic growth and "key indicators of operation of a modern economy" (Pradhan et al. 2014). Others have discovered "a positive causal link" between telecommunications infrastructure and economic growth, noticing that the link exists if "a critical mass of telecommunication infrastructure is present" (Röller and Waverman 2001). It has been also uncovered that telecommunications development affect economic growth, not only directly but also in implicit way (Thompson and Garbacz 2007), and, there have even been attempts to estimate economic value created by the diffusion of broadband (Greenstein and McDevitt 2009; see also Fornefeld, Delaunay and Elixmann 2008). Some scholars even have argued that "real GDP" represents "a function of labour force, capital stock and broadband and fixed line infrastructure", what is expressed in mathematical form as GDP=f(K, L, BB_lines) (Gruber, Hätönen and Koutroumpis 2014).

The result of this understanding of the public interest has been expressed in a number of attempts of governments in different parts of the world to promote development of broadband telecommunications networks and to solve the problem of digital divide. In 2009, the Federal Communications Commission (FCC), fulfilling the Congress's Mandate, started the process of creating a national broadband plan "to ensure every American has "access to broadband capability"" — "Connecting America: The National Broadband Plan". This plan has been praised as a roadmap for the industry development and was promoted by Obama administration. The plan is clearly overlapping with the aims of universal service in its modern understanding: "universal availability and adoption of broadband," "universal access to broadband network services," affordability of broadband access to low-income Americans. However, it has also added an additional component — "digital literacy" — and appealed to state interventions in order to ensure that "every American has the opportunity to become digitally literate."

On the other side of the Atlantic, the European Commission launched "The Europe 2020 Strategy," where one of the main "flagship initiatives" is "The Digital Agenda for Europe." Among the objectives of the Digital Agenda there are creation of

a single European digital market, promotion of interoperability and standards, attraction of investment in networks, facilitation of "innovation efforts", combating the "lack of digital literacy" and "digital divide", encouragement of the Next Generation Networks (NGA) development, and so on and so forth.

Both strategies, in the US and in the EU, envisage particular characteristics of the broadband that have to be achieved in the territories. The "goal № 1" of the US plan is that "[a]t least 100 million U.S. homes should have affordable access to actual download speeds of at least 100 megabits per second", while the European agenda establishes the aim that "by 2020, (i) all Europeans have access to much higher internet speeds of above 30 Mbps and (ii) 50% or more of European households subscribe to internet connections above 100 Mbps." And this particularity, as well as requirements of "digital literacy", make the digital divide concept — or possibly it might be named in this case by some alternative terminology — different from both previous approaches to universal service: historical, that was aimed at consolidation and uniformity, and modern, that is aimed at affordability and ubiquitousness.

From such a perspective, using market imperfection as a justification for interventions, it might be inferred that there are market failures conceived by governments on the both sides of the telecommunications market: on the demand side the market is not able to create a necessary demand, and, simultaneously, on the supply side, the market is unable to satisfy the demand without government interventions (see, e.g., Gruber, Hätönen and Koutroumpis 2014). In other words, there is a widely accepted view from the positions of the public interest how the industry should look like, and the inability of the market to achieve this vision (and the problem indeed might be in both — demand and supply — sides) is becoming an issue of market failure in such a modern view.

3.3.4. Weakness of the public interest view on the universal service and digital divide problem

There are at least two possible ways of reasoning about the weakness of the public interest view on the issue. Firstly, it is not precisely clear whether we are dealing with a problem of market failure, and, thus, are the interventions appropriately justified? Secondly, it is also a problem for the public interest theory to justify the adopted way of achieving the public interest goals.

The lessons of the early days of the industry suggest that the market was better suited for the promotion of the industry development, reduction of rates, expansion of the network in rural areas, and, thus, the justification of the universal service goals in their modern view from the market failure position seems questionable; and we already partly discussed this issues in the previous chapter. The existence in developed countries at the beginning of the 21st century of large populated areas where supply of telephone services were insufficient, or where prices for such services were unaffordable for a significant part of population, is rather the consequence of the monopolistic state-run industry of the 20th century than the problem of market imperfections. Of course, it does not signify that the problem should not be solved, but this means that the alternative to the state interventions for universal service could be the restoration of the market mechanisms in the industry and full liberalization of the field.

The belief that the industry is unable to cross-subsidize services and that without rates-regulation the prices will become unaffordable for some social groups has been contradicted by the empirical evidence of the early days.[86] On the contrary, the problem of cost separation in telecommunications has always existed due to the usage of the same elements of the network in the provision of different services (Mueller 2013). Indeed, it could be a situation of different prices for the services in different territories, but totally in the same way we have different prices in other markets. The prices in a grocery-shop in a remote village are often higher than the prices in a supermarket in a city, but this situation is not considered as an example of market failure. Moreover, different wireless technologies that appeared in the market at the turn of the century were able to change dramatically the cost structure of service provision in rural areas, and the public interest in this field could be found in relaxation of regulation of particular parts of the radio spectrum in such territories. The same might be said not only about telephone services, but also about access to information services.

It is also very important to keep in mind that over the 20th century, universal services very often "meant universally poor service," while introduction of competition in the industry has "done more to achieve the objectives of universal service" (Stiglitz 1999), and this situation per se questions the "public interestedness" of this concept that, at the same time, was one of the main justifications of the monopolistic nature of the field. It is interesting to notice that there are examples

[86] See the discussion above in section 3.3.1.

that challenge the public interestedness of the universal service idea also in other network industries and vital segments of public utilities — water supply, electricity, sanitation —, and show that the market has been able to provide better solutions than the policy based on the public interest explanations (see, e.g., Ehrhard and Burdon 1999).

The necessity for the government aid of broadband provision as a necessary measure for economic growth and, especially in the form of stimulating broadband demand and subsidization of the supply side, might also be challenged by simple reasoning. At the end of the first decade of the 21st century it has become apparent that the high broadband penetration level and affordability of the services in rural areas, that in fact already were in place in many developed countries, do not provide any protection for the economy and do not warrant economic growth. The negative GDP growth rate of Euro zone in 2012 and 2013,[87] when broadband penetration had become even higher and already been augmented by the appearance of the advanced wireless broadband, openly questions a positive correlation between broadband provision and economic development. Of course, there are other factors that influence performance of an economy and that might be blamed for the economic stagnation, but precisely the existence of other factors is ignored by the theories that claim that the economic growth is "a function of labor force, capital stock and broadband and fixed line infrastructure" and that has been incorporated in public policy. The advertisement of the European Digital Agenda that "[t]he Internet economy creates five jobs for every two 'offline' jobs lost" vividly contradicts the reality if we look at the EU unemployment rates, that achieved its historical maximum in 2012-2014,[88] and clearly exposes the populism of European policymakers that hardly might be explained by the real public interest stance, even if the proclaimed objectives seem public spirited. The economic collapse of Ukraine and recession of Russian economy, the countries that in the period 2010 - 2012 demonstrated the best figures of the FTTx development in Europe (FTTH Council Europe, 2012), explicitly show that the

[87] See the data at http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tec00115&plugin=1

[88] See the data at http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=une_rt_a&lang=en

good indicators of telecommunications industry are by far not sufficient conditions for economic development.[89]

Moreover, in addition to the questionable correlation between telecommunications development and economic growth, it is also possible to find a link between the expansion of the networks and the growth of income inequality; and this link, unlike the former case, in a number of world countries, did not interrupt in 2008 (see, e.g., Cingano 2014). The more developed telecommunications networks, the more affordable the services to different strata of society and in different territories, the higher the level of inequality and richer the richest persons of the world. It is very important to underline that this is not a claim about a causal relationship between these variables; on the contrary, it is quite probably that the growth of the network might reduce inequality, but, at the same time, it is possible to argue that this depends on the regulatory regime which governs the field.

Furthermore, some recent figures show that not only the inequality gap has been expanding since the start of the transition towards the post-industrial society and development of the worldwide broadband access, they also show that a significant part of population of the developed world has become poorer than it was several decades ago. The remarkable picture of the US economy, according to the results of the recent studies, shows that the bottom 50% of the population had lower incomes in 2015 than they had in 1978, while the top 0.001% enjoyed a growth of 685% (Alvaredo et al. 2017). The situations in other countries is different, but the main trend towards accumulation of wealth in the hands of a few has become a common attribute of regulatory capitalism (see, e.g., Cingano 2014).

Since the telecommunications industry is among the major driving forces of the new economy, the question could be posed about the role of telecommunications development in such unequal distribution of wealth. However, it seems that the more appropriate question is about the impact of government interventions that have shaped the trajectory and pace of the evolution of the industry on the eventual distribution of economic benefits from the modern networks. And here, the problem

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[89] Moreover, the Russian case supports two different ideas at the same time: firstly, that telecommunications are able to achieve sufficient figures under the governance of market rather than government mechanisms, and, secondly, that the ongoing monopolization of all sectors of the economy, where telecommunications are not an exception (over the last several years after a number of mergers and acquisitions the industry has become much more concentrated that it was even in 2010 - 2012), and what is a direct result of the "kleptocratic authoritarianism" (Dawisha 2015) and regulatory suppression of independent economic activity, is one of the major cause of the tremendous level of income inequality (Credit Suisse 2014) and economic stagnation.

might be interpreted not even in the way of too much or too little regulation, but in the appropriateness of the established goals and measures of their realization.

The real, open and competitive market in the industry could be an alternative for the implemented ways of achieving socially desirable objectives, but it does not signify that the government should retreat from the area. On the contrary, it should find ways to form such markets and maintain their openness and competitiveness, rather than regulate the oligopolistic field through attempts to promote artificial competition in the places where such competition would be impossible in the real marketplace. In other words, using the terminology of Hayek highlighted in the Introduction, the goal of the state should be the establishment of the competitive order in the industry rather than interventions that maintain the ordered competition regime. Of course, the ability to achieve such a solution is limited by political mechanisms and existing institutions, but it does not signify that economics has never provided recipes how the market can really serve social needs, and these alternatives will be discussed in section 3.4. The problem is that these proposals have never been adopted and public choice explains us why the policy has always chosen worse alternatives.

3.3.5. The public choice perspective of the universal service and digital divide problem

Public choice scholarship has already paid attention to the notion of universal service. For example, Brady, analyzing "political and institutional forces that limit deregulation," points out that new regulatory regime had preserved "a host of special "universal service" subsidies for favored groups" (in Tullock, Seldon and Brady, 2002). In general, among these favored groups are not only companies that get subsidies for development of their network, there is a number of low-income citizens, people who live in remote areas, and those who merely benefit from below-cost pricing even if there are no moral justifications for such provision. As was noticed above, universal service is a system of redistribution of incomes that forces some groups of people to pay for services consumed by others, and political decisions that aim at creation or preservation of such a system may have a positive attitude from the side of particular groups of voters. Since in the monopolistic telephone industry, the cross-subsidization often took a form of higher rates for long-service calls, that were mainly consumed by business customers, and lower rates for households,

"households voted for business to transfer income to them through lower phone rates" (Tullock, Seldon and Brady, 2002).

Deregulation of the industry revealed that such systems of cross-subsidization are one of the major impediments for the creation of a competitive market, but in the new institutional arrangements the problem is reformulated from a system of income redistribution to a system where some market participants have an opportunity to get a competitive advantage over others in one form or another. On the one hand, it might be an advantage of newcomers whose prices are not regulated, but on the other hand it might be an advantage of incumbents if regulation forces newcomers to contribute to their services provision. A significant number of countries around the world has chosen the latter option,[90] but it is also necessary to notice that this is not a single pattern that has been adopted by every national territory. Moreover, some countries have adopted the view that universal service should be supported from their national budgets,[91] rather than through mandatory contributions of market players, but such an approach does not eliminate the problem of regulatory capture and use of public resources for private business interests. And again, through the perspective of public choice theory, these varieties might be explained by different lobby opportunities of interest groups in different countries, by different level of corruption and by different attitude of society to the role of government in the economy and to the role of small independent entrepreneurship.[92]

The views, promoted by social sciences and politicians, that growing industries of the new economy require government support, and that this support will bring positive consequences for all, could not be rejected by the public, just because in this picture about everyone saw their own personal benefits. The numerous plans and agendas have always been supported by arguments about the necessity to solve problems of the poor and people with disabilities that in modern western civilization are treated as morally good justifications. The augmentation of the policy by proposals about state run enhancement of "digital skills" that will allow people from different social and age groups to become active members of the emerging information society even had not required any requests of these people in order to be positively accepted by those who already considered themselves as a part of it.

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[90] USA, France, Italy, Russia, Nigeria, Afghanistan, India, etc (GSMA 2013)

[91] E.g. in Chile, Paraguay (GSMA 2013)

[92] See, e.g., the approach in South Korea (GSMA 2013)

As a result, for many politicians it has become essential for their political career to take advantage of the embraced view on the role of new technologies and, what is more important, on the role of government in their development. It could not be left up to market forces for political reasons. After the crisis of 2008-2009, the distrust of the market by the public had increased, and as an outcome, we have faced new regulatory solutions and new policy agendas, where the infocommunications area has taken a prominent place. The US broadband plan and the European Digital Agenda appeared as responses to the crisis and provided explanations of how the government is going to cope with the problems, and that was necessary in order to protect the positions of the established political leaders. If the issue could be explained by public interest theory, then the reasonable question could be why, if the Agenda is able to "spur innovation, economic growth and improvements in daily life for both citizens and businesses," was it adopted only after the crisis struck the economy? Why was particular attention to the necessity "to maximize the social and economic potential of … the internet" paid in 2010, but not 10 or 15 years before? Why did the FCC realize that "Federal, state and local governments … should take steps to improve utilization of existing infrastructure to ensure that network providers have easier access to poles, conduits, ducts and rights-of-way" only by the end of the first decade of the 21st century, but not when the industry was liberalized and when all of these measures already were vital for the industry and competition development?[93]

Meanwhile, more government intervention in the industry does not only mean that it reflects public demand on more government and socially desirable objectives. It also reflects the interest of particular groups that are seeking the rent in regulation, and the negative attitude of the public toward free market mechanisms helps them to meet their private interests (see Rajan and Zingales 2003). The idea that through various kinds of fiscal support, society helps the poorest social strata to be included in the growing information society represents the issue in a misleading way. It provides a wrong impression about the real economic process, and in this reality society invests public resources in the creation of private means of production that generate revenues and profits for the owners of these assets, even if some other social members somehow also benefit from the process.

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[93] European policymakers introduced the similar approach in EU efforts to reduce the costs of deploying broadband networks only in 2014 (Directive 2014/61/EU of 15 May 2014), noticing that "[s]ome Member States have adopted measures intended to reduce the costs of broadband roll-out. However those measures remain scarce and scattered."

There are robust reasons to assume that the solution of problems of the poorest through public support of private assets controlled by the rich contributes to the enrichment of those who get this support. Murray Rothbard's (2006) claims that redistribution mechanisms work "within income categories, [when] some poor are forced to pay for other poor" while "[g]overnment contracts … funnel tax funds into the pockets of favored corporations" provide plausible explanation for the real causes of the growing amount of social and economic problems that go along with the modern regulatory version of capitalism. And if indeed the arguments about the important role of telecommunications in the economic activity of the modern world hardly might be challenged, the interventions aimed to achieve the objectives through the implemented methods bring rather negative consequences and form the links between the industry development and socio-economic problems. However, it does not signify that government should do nothing if society really sees any interests in the solution of such kind of problems. The last sections of this chapter aims to show which alternatives could be implemented by the policy.

3.4. Liberalization of the industry

3.4.1. The public interest explanation of liberalization

It might be argued that the public interest approach gives a strong explanatory basis for liberalization of the telecommunications industry, especially if we look at the results. Modern telecommunications provide us a big variety of different services, many of which could even not have been imagined and could not be placed into policy documents 20-30 years ago. The introduction of market mechanisms, the appearance of private initiatives and technological progress have changed our world, making the industry one of the main drivers for economic development. Any arguments that preservation of the state-owned monopolies and state governance of the technological development could better fit the growing needs of our society would hardly be positively met by the contemporary scientific community.

Despite the vagueness and indefiniteness of the public interest concept, the liberalization and deregulation of the telecommunications markets is one of those cases where even critics of the approach might agree that it was a movement toward social needs. Some even argued that "social developments seemed to refute" the theories that look at regulation from the positions of private interests (Den Hertog

2010). However, it seems that the public interest view does not provide a comprehensive explanation at least for two aspects of the reform. The first is the timing, or more precisely why the process had not been initiated earlier, and the particular peculiarity of the issue is that the reform was enacted in a large number of world countries around the same period. The second is the way of the reform, or why the outcome of the reform was programmed as a set of oligopolistic markets that sometimes are represented in transnational oligopolistic form. Moreover, it is reasonable to find whether there were alternative ways for the reformation of the industry.

Many researchers connect the beginning of the reform with technological change that forced states to open their telecommunications markets (see, e.g., Stiglitz 1999; Laffont and Tirole 2000), and from this point of view policymakers had no choice, but to deregulate. Public interest theory explains it in the way that new technological solutions allowed to remove market failures that warranted the interventions in the preceding periods or that deregulation in the new technological environment is the more efficient solution for the market failure problem than regulation (Den Hertog 2010).

The first question that arises from this explanation is what was the market failure that supported the monopolistic nature of the industry? Despite the fact that the idea about natural monopoly characteristics of telephone services has been incorporated in the mainstream understanding of economics of telecommunications (see, e.g., Posner 1968; Joskow 2007), many empirical studies have questioned this paradigm (see e.g. Evans and Heckman 1983; Shin and Ying 1992; Bloch, Madden and Savage 2001; see also the discussion in Spulber and Yoo 2013). There was a large number of explicit claims about the artificial nature of such monopolies and the role of the government in their formation (e.g., DiLorenzo 1996; Thierer 1994), and the example of the US industry that we discussed above shows that the industry could have a competitive form (Mueller 2013; Janson and Yoo 2013).

Moreover, the first years of liberalization in many instances were not the years that brought to the markets new services or advanced technologies. Of course, some subscribers benefited from new technological solutions in long-distance or mobile services, but for many the beginning of the liberalization just yielded ordinary phones

in their homes.[94] While the state explained state control of the industry by the necessity of provision of socially valuable services for all members of society, these services, for a long time were rather luxury goods for a significant part of the households in many places of the world. The market had solved this public interest issue more efficiently and faster than the state during the previous years of inefficient state governance, which M. Vestager, the European Commissioner for Competition, has described as "the days of national telecom monopolies …: high prices, low service quality and less innovative products".[95] The market failure approach is unable to explain the government control of the industry before the liberalization period. If the real motives of policymakers had always been based on the public interest, the industry would have been kept in the market conditions from the very beginning.

The second question is what could be an effect of liberalization on technological development of the industry if the market mechanisms were introduced earlier, and we can assume that in this case we could face more rapid technological progress. As an example, digital switches and fiber optic, as well as, cellular telephony are the technologies that started spreading in the monopolistic industry in the 1970s-1980s and resulted in the growing number of networks subscribers, but they were not the technologies that were developed in the 1970s-1980s. Tim Wu (2008, 2010), for instance, argues that by 1916 AT&T already had "a working prototype" of a "wireless telephone", but since the technology was in the hands of the monopoly of the "wired" industry, it could not have chances to be driven by market forces.

The 1990s and 2000s were the periods where the market demonstrated how fast it is able to adopt and facilitate diffusion of technological advancements, reducing the costs of technological solutions and bringing the services into new areas, and, therefore, it is reasonable to suggest that the market could do it much earlier if the government did not suppress the market mechanisms in the industry. Of course, it might be argued that the level of semiconductor industry of that time imposed some limitations and that, for example, the weight of the first cellular phones made them

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[94] E.g., Armstrong and Sappington (2006), analyzing the development of the industry in Chile, show that "liberalization" allowed to increase the number of fixed lines more than three times between 1992 and 2000. The similar picture can be found, for example, in Russian telecommunications industry that is discussed in the next chapter. Stiglitz (1999) notices that in many countries the reforms had expressed in "increases in the scope of telephone coverage and reduction of prices", and that "in many developing countries, entrepreneurs have … demonstrated their ability to bring telephone services to poor villages".

[95] The text of the speech at 42nd Annual Conference on International Antitrust Law and Policy available at https://ec.europa.eu/commission/2014-2019/vestager/announcements/competition-telecom-markets_en

inconvenient for subscribers or that the production cost did not allow widespread diffusion of the technology, but, at the same time, we have to admit that the state preservation of the monopoly until the last decades of the 20s century by no means played in favor of the industry development, cost reduction, and it is not clear whether it played for the public welfare.[96]

The public interest paradigm in the chosen way of the liberalization also induces a number of questions. Why had the industry not been torn apart in a number of independent enterprises, vertically and horizontally,[97] which could have helped eliminating the problem of market power and, thus, the necessity to create artificial competition? Why did the chosen way of the reform so vigorously require the slowness and prohibitiveness during the first phases of the process? Why might deregulation in many places of the world, in fact, be better described as re-regulation (Yoo 2010)? Whose interests, public or private, did prevail in the chosen methods of the reforms?

Answers of the public interest approach to the questions above might be based on prevailing views in economics of telecommunications that payed significant attention to the natural monopoly characteristics of crucial parts of the industry and high level of sunk costs of telecommunications networks. There were also concerns that liberalization could result in rates, as well as costs increases, reduction of service quality and R&D expenditures, problems with technical compatibilities and so forth. However, it is important to note that there was a lack of unanimity among the telecommunications policy scholars. Eli Noam (1993), for example, distinguished four main positions based on different combinations of antitrust and deregulation dimensions: anti-monopoly/deregulatory, anti-monopoly/pro-regulatory, pro-monopoly/deregulatory, pro-monopoly/pro-regulatory.

Some of the scholars from the anti-monopoly camp advocated the idea that "competition is needed to be established by intervention" and appealed to the divestiture of incumbents (Noam 1993), but, nevertheless, even these anti-monopoly appeals have been severely limited by the mainstream theories. As a result, nowhere in the world a telecommunications marketplace dominated by small independent enterprises was formed by the "anti-monopoly" movement. There were examples of

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[96] According to some estimates the delay in introduction of mobile services in the US decreased consumers' welfare on dozens of billions of dollars (see Hausman 1997; see also Rohlfs, Jackson, and Kelley 1991).

[97] It is necessary to acknowledge that the pattern was not totally the same everywhere, but, nevertheless, the results of privatization are regulatory formed oligopolistic markets.

the USA, Japan, Brazil, Russia, where the break-up of the former monopolies vividly played in the interests of the public, but the policymakers did not envisage that the basic unit for the newly formed landscape could be a network within the coverage of a telephone exchange or a network of a scale of a city.

Despite the appearance of new technologies and advancements in economic studies, the natural monopoly belief did not vanish from the general understanding of the economy of telecommunications in the 1970s — 1980s. However, the idea that not all parts of the industry share these natural monopoly characteristics eventually appeared in the mainstream. But this did not challenge the monopolistic status of the local phone networks that was the core part of the industry providing customers access to not only local services, but also to intercity and international connections, and that eventually became a fundament for the construction of the broadband networks.

Many scholars and authorities in the 1980s claimed that "local telephone services seem to be generally accepted as a natural monopoly" (Breyer 1982, as quoted by Spulber 1995), and that without the natural monopoly argument "restriction of entry into the local telecommunications loop is not justified" (Spulber 1995). Indeed, this justification could be the only plausible explanation of public interestedness in the preservation of monopolies in local parts of the telephone industry during the initial phases of the reform and slowness of the liberalization process.[98]

The natural monopoly paradigm of the 20th century has not escaped from the policy even in the new era and continued to play an essential role as an idea of bottlenecks. Laffont and Tirole explicitly link the concepts of natural monopoly and bottlenecks in their highly-cited book "Competition in telecommunication" (2000) when they argue that some segments of the industry are natural monopolies and that "these segments become bottlenecks". They also point out that the location of the bottlenecks depends on the technology and that it changes with the industry's evolution. They go further and argue that technological development at the end of the 20th century allows "experts … [to emphasize] that long distance had become a

[98] See also explanation of the chosen duopoly policy in the UK in the 1980s, that is also based on the arguments that are usually associated with the natural monopoly paradigm: "The creation of a new network requires very large investment, which will mean a long period before the investment can yield a return. ... To avoid uncertainty the Government have now decided to make it clear that we do not intend to license operators other than BT and Mercury Communications Ltd. ... during the seven years following this statement." (DTI 1990, as quoted in Cave and Williamson 1996).

natural monopoly". Such a statement, as well as the attention that has been paid in the telecommunications policy to the problem of bottlenecks are vivid evidence that the natural monopoly paradigm, in fact, has never left the mainstream view on the industry, even despite the concept nowadays has been severely reduced to some particular segments of the field.

Meanwhile, from the history of competition in the early days in the US it is clear that the average cost curve did not have a downward slope, i.e. the industry was not an example of a natural monopoly according to the classical definition of the term. There might be a hypothesis that later technological development changed this feature, but this is not more than a hypothesis that has been questioned by many scholars (see e.g. Evans and Heckman 1983; Shin and Ying 1992), and even in the mainstream theory we could find the statement that "as more subscribers are connected to a telephone network, the average cost per subscriber may rise."[99] In other words, there is no robust evidence that theoretical models based on the natural monopoly have ever reflected reality, while they have always perfectly supported industry policy and continue to provide this support.

The understanding of telecommunications as an example of natural monopoly in one form or another ruled the reforms of the last decades in the majority of the world countries. For example, the European "deregulation", "demonopolization" and "privatization" reform of the telecommunications sector started in 1987 from the introduction of the "Green Paper on the Development of the Common Market for Telecommunications Services and Equipment" by Commission of the European Communities.[100] The reform that put telecommunications services in the "market environment" took more than 10 years and did not allow competition in different fields of the industry at once. This slowness and prohibitiveness has been already highlighted in the previous chapter. At first, in 1988, the doors of the market were opened only for the equipment manufacturers. After two years, in 1990, the policy allowed to compete in "non-voice services and voice services for closed groups". In

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[99] Joskow (2007) with reference to Posner (1968), where his proposition is following: "If the entire demand within a relevant market can be satisfied at lowest cost by one firm rather than by two or more, the market is a natural monopoly, whatever the actual number of firms in it." On the one hand, from such reasoning, it can be inferred that a natural monopoly situation does not necessarily require presence of economies of scale. However, on the other hand, in this case it is totally unclear how anyone can prove that "the entire demand … can be satisfied at lowest cost by one firm" (especially if we do not take into account "the actual number of firms" in the market), and, thereby, such an approach makes the defense of the natural monopoly hypothesis even more unconvincing.

[100] Available at http://ec.europa.eu/archives/information_society/avpolicy/docs/reg/tvwf/com_1987_290_en.pdf

1995, competition in Cable TV became possible. One year later, mobile communications. And only in 1998, ten years after the start of the reform, the possibility to see advantages of competitive markets in the voice telephony services emerged. In addition, this slow motion towards the creation of the "competitive market" was augmented in many instances by the prohibition to compete by the telecommunications infrastructure. The regulatory model of the 1987 Green Paper that was in place until 1996 stressed the distinction between services and infrastructure. Then, in 1996, "the use of infrastructure for telecommunications services was liberalized to the extent these services themselves were liberalized", and only in 1998 the full liberalization of telecom infrastructure finally occurred (Larouche 2000).

Of course, if a company has invested in the infrastructure construction, a bigger number of connected users through this infrastructure will reduce the average cost. However, this, firstly, does not mean that if the industry consists of a number of companies operating in different districts, cities or regions, then this industry has higher average costs than it could have if the only one operator provides the services in the entire territory; and, secondly, it even does not mean that service providers operating in nearby areas and even in the same areas will not be able to benefit from economies of scale of their own networks, do their business more efficiently than a monopolist, and, at the same time, provide their users the possibility to benefit from the total network effect through the interconnection of their networks.

It might be argued that in such a case we face local monopolies, but if their operating area is sufficiently small, that means that overlapping of the areas is feasible and that the local monopolies are under pressure of potential entrance of the nearby competitors. It is very important to note that one of the mainstream theories — the theory of contestable markets — looks at the issues from the similar viewpoint. According to this theory, even those markets that have a monopolistic or oligopolistic structure might provide the same outcome as "perfectly competitive markets" if they are perfectly contestable (Baumol, Panzar and Willig 1982). Spulber and Yoo (2013), for example, even argued that "[t]echnological change … has made telecommunications markets contestable by reducing the sunk costs associated with market entry." From this point of view, there is a crucial difference between a monopoly in a non-contestable market and a monopoly in a contestable market. If highly concentrated markets are under the threat of potential competition, their outcomes are closer to the competitive level (Baumol, Panzar and Willig 1982). The

deregulation movement had a chance to promote this kind of contestability in the industry. Deviation of such a monopoly from the optimal performance or opportunities for monopolistic competition due to technological pluralism makes overlapping inevitable if the network structure is represented by a number of independent networks, and, thus, these local monopolies could be easily destroyed by the real market process.

Moreover, such an approach would allow to countervail another feature of telecommunications that is very often underlined in the economics of telecommunications literature, namely the high level of sunk costs. In the fixed telecommunications industry,[101] the notion of the high level of sunk costs mainly makes sense when we are tackling with the necessity of construction of networks of a big scope, passive elements of the network that could be considered separately from telecommunications assets (such as ducts, poles, masts, etc., and the next section is dedicated to the issue) or when we are dealing with construction of special objects such as submarine cables or very long distance cables whose construction induces significant transaction costs and so on.

Regulatory endorsement of small independent entrepreneurship in the industry could eliminate the high level of sunk costs related to big networks, just because the network could be represented by a number of small networks and it could reduce the risks that usually associated with the sunk cost phenomenon. In this case, the sunk costs would be dispersed between many enterprises in the same way as total costs of any industry are distributed over its participants. The mere fact that networks are interconnected does not make sense for business practices to consider them as a whole, while the holistic view is widely implemented in the mainstream models of economics of telecommunications. The network is merely a large set of interconnected networks where not only the total sunk costs are shared by all the participants in the same way as in any other industry, but where also positive network externalities provide benefits to all of the actors regardless of the relative size of their parts. In other words, the cost side of the industry, if it has a distributed form, does not distinguish telecommunications business from other areas of economic activity, while network externalities are able to provide benefits to all participants of the network.

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[101] The modern cellular networks do not allow to implement the similar analysis due to the high fixed cost of the central elements, but again we have to take into account the mutual shaping of regulation and technological development where the implemented solutions and network architecture were affected by the process, while a pluralistic landscape, that could be a target of regulatory efforts, was able to change this nature of the wireless field (this issue will be analyzed in Chapter 5).

Therefore, the analysis of the industry from the position of a small firm does not raise a problem of a high level of sunk costs, while this phenomenon is a heritage of the old natural monopoly view that has, eventually, contributed to the preservation of the field in oligopolistic forms and prevention of formation of the competitive order in this area.

The empirical evidence of the horizontal separation proves how beneficial it could be for the industry development, innovation and consumer welfare. When 24% of the market of broadband access of Moscow in 2006 was served by small companies that had less than 2 000 subscribers each (Gabitov 2006), and when the dominant technology of the provision of the services in the city already was FTTB (Potresov 2006), that, basically, signifies that the market was able to have such kind of structure and that this structure provides more efficient solutions than a highly concentrated marketplace. The fixed telephony market of Samara, whose population at that moment was less than 1.2 million inhabitants, by the end of the 1990s, was represented by four major players, including the successor of the former monopoly, that jointly formed the local backbone for the telephone services in the city and about three-dozens connected to the backbone independent operators of telephone services. As a result, by 2007 the competing broadband access services providers constructed a number of independent broadband infrastructures in the city, that in some districts led to subscribers having a choice between four broadband providers in their houses at the same time. This overlapping was an inevitable outcome of the horizontal separation, and it shows that the real competition in the industry did not require local loop unbundling, nor wholesale access regulation to the broadband networks,[102] nor other means of promotion of the artificial competition. The Russian case, that will be analyzed in more detail in Chapter 4, provides many examples of how the market develops rivalry if the initial conditions of the industry are favorable for this process.

3.4.2. The view on liberalization through the lens of private interests

The economic theory of regulation promoted by the Chicago school describes deregulation from positions of private interests (see, e.g., Peltzman 1989). It is

[102] However, there was a problem of interconnection with the successors of the former soviet monopoly, whose significant market power had been preserved and supported by the regulation.

possible to distinguish different explanations of why captured regulation makes a choice of deregulation, especially taking into account that deregulation usually takes a form of new regulatory environment, and among them the changing balance of political power of pressure groups or a decision of influential groups that they can better promote their interests in the alternative regulatory regime.

However, it possibly would be an exaggeration to claim that all regulatory bodies everywhere in the world were taken by the main interest groups and acted explicitly in order to put their private interests in the policy agenda. We also cannot neglect the role of international institutions and other forces that affected the liberalization movement in telecommunications. In such reasoning, Brady, for example, emphasizes the role of supranational institutions in the process such as the European Union, the World Trade Organization and the International Telecommunication Union, as well as positive experience of other countries (in Tullock, Seldon, and Brady 2002). Schneider (2001), analyzing the deregulation in Germany, France and Italy, points out the role of OECD and GATT, that have been used as "bargaining arenas" for the "US strategy … to open international markets in this sector". Levi-Faur (2005), describing the rise of regulatory capitalism starting in the 1980s, points out the version that "international institutions, acting at least partially as agents of the United States," have been the main sources of liberalization reforms in other world countries. Joseph Stiglitz (1998), analyzing "the private uses of public interests," notices that "international issues are probably more subject to capture." In other words, it has become common in the academic society to suspect that international institutions serve the particular private interests of the most influential global groups, even if their positions have been supported by the claims about the national interests, and their role in the reforms of telecommunications policy is not an exception from this pattern.

Milton Mueller in his well-known book "Networks and States: The Global Politics of Internet Governance" (2010) argues that the world-wide liberalization of telecommunications was pushed by the US in the interests of the US economy, and some facts support this suggestion. In the previous chapter we already discussed the interests of the former American telecom monopolist, AT&T, in the European market of telecom equipment and described the activity of the giant in this sphere. The traces of the US interests in the international arena have been augmented by business interests of leading players of the European advanced economies. Schneider (2001), for example, points out that European Commission's allies and supporters in the

mid-1980s were large European industrial firms such as Alcatel, Olivetti, Philips, and Siemens, and this statement in combination with the activity of AT&T in the European market at that time might explain why the first step in the liberalization was the opening of the market of telecommunications equipment. There are also claims that for major European telecommunications enterprises, the opening of the international telecommunications sphere signified opportunity to expand their business empires and that these benefits outweighed the losses from the necessity of reciprocal duties to allow competitors to enter their local marketplaces (Clifton, Díaz-Fuentes and Revuelta 2010).

Such views provide some alternatives to the public interest explanation of the liberalization of telecommunications at the end of the 20th century and give answers to the questions about the timing and chosen methods. When we look at the field from the position of public choice theory, we have to bear in mind that the units of analysis are not companies or organizations, but individuals. This view also corresponds to the Austrian methodological approach. The individuals might cooperate and form different groups with those who have similar interests or might be useful for a while, but, nevertheless, these private interests are the interests of particular persons. Moreover, these interests are not always expressed in financial terms, and often take a form of behavior that by no means can be considered as wrongdoing. If politicians even with the "good spirit" were keen to adopt particular methods of deregulation of the industry, they had to make a choice, and this choice had been affected by other people, who not necessarily were so unselfish and public-spirited, and by experience of other territories, that had not necessarily been formed by uncorrupted policymakers.[103] An alternative way of the reform could bring unforeseen results and it imposed risks on the decision-making process. From the position of private interests, this phenomenon might be explained by economic rationality of policymakers that also include cognitive components, rather than by the rent-seeking conduct (Zamir and Sulitzeanu-Kenan 2017), and in this sense, the widespread acceptance by policymakers of the deregulatory idea is an example of "contagious diffusion", when it was merely more reasonable for them to follow the choice of the benchmark regulatory regimes regardless of the real public or private interest intentions of the initial reform.

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[103] In general, regulatory capture theory provides a number of examples when the capture occurs in a natural way (see, e.g., an explanation of the "natural capture due to specialization" phenomenon in Zingales (2014); see also Koopman, Matthew and Thierer 2015).

Liberalization went hand in hand with privatization, and it opened opportunities for some individuals to become the owners of the valuable assets, and sometimes the price paid for this newly formed property was lower than the real price or could be considered in this way. Acemoglu and Robinson (2012) in this sense point out the remarkable case of Mexican telecommunications industry, but even European countries where governments are often considered as more public-spirited, have also faced the situation when "today it is clear that the price could have been higher".[104] However, we can only guess why the price was in fact lower than it could have been, and private and public interest theories of regulation provide us totally different explanations. For those people who benefited from privatization, the alternative ways of telecommunications reform would not bring such benefits, but again they were not the only stakeholders of the industry. There were officials, bureaucrats and managers that governed the industry during the days of state-owned monopolies, and while the alternative would signify the immediate solution of separation of operational and regulatory functions, for these stakeholders it could mean uncertainty of their future positions and personal incomes.

Another important issue of the "liberalization — privatization" reform is an attempt of governments to raise the revenues that they could receive from privatization, and here there is a clear contradiction between the goals of creation of a competitive market and maximization of the governments' incomes. Business endeavors that promise monopoly profits cost higher than enterprises whose future positions are highly uncertain due to the competitive environment of the marketplace. From this point of view, preservation of significant market power of an incumbent allows to get higher revenue from its sale than if the company had been split up into a number of independent enterprises competing between each other. In many jurisdictions, privatization in the industry even assumed an "exclusivity period" for the incumbents, that, definitely, in the same way as the widely implemented delay in the placement of all services in the competitive environment, could not play in favor of competition.[105] As a result, privatization of telecommunications assets "in many countries failed to foster competitive markets, instead creating large private monopolies" (Wallsten 2002).

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[104] The claim is from the analysis of privatization of Telecom Italia (Florio, 2007).

[105] For the analysis of the implementation of this approach in privatization of the industry see, e.g., Wallsten (2004).

Even the positive experience of the US divestiture of the former monopoly into seven independent companies and the separation of the local and long-distance business, was not considered as a guidance for others. On the contrary, there are totally opposing examples. For instance, the former Italian monopoly, that before the liberalization was represented by several companies (SIP (local services), Iritel (local and long distance services), Italcable (inter-continental long distance services), Telespazio (satellite communications) and SIPM (maritime communications)), merged these assets in Telecom Italia in 1994 (GSMA 2013). Even if we assume that this concentration was necessary to get the most possible revenues for the government, there are reasons to suggest that public interests were not the main driving forces of the process.[106] Some scholars, noticing that "[a]greement between the political system and private interests in the field of telecommunications has been an integral part of Italian economic history", openly name the Italian telecom privatization as an example of "privatization failure" (Florio 2007). Another possibility for competition were cellular services that de facto represent a substitute for fixed telephony, but in a number of countries around the world, incumbents became the major players in the new mobile markets, which again contradicts the objectives of formation of a competitive marketplace.

The slow pace of deregulation and prohibition of competition in many markets in the initial phase, and allocation of radio resources for the incumbents, provided them opportunity to adopt their business to the changing institutional and, what was even more important for them, technological environment. The Internet was accompanied by a number of technologies that threatened the established order of telecommunications from different directions. New opportunities to use radio waves were opened, legacy copper lines were losing their value in the face of the advancements of fiberoptic technology, the growing semiconductor industry was able to make totally obsolete the legacy communications equipment operated at that moment. Newcomers, once the industry was opened, could leverage implementation of new technologies and destroy positions of the incumbents. Of course, it might be noted that the "liberalization" movement allowed to "trim the fat" of the former monopolies (Larouche 2007), but it has not eliminated the problem of economic power, has not formed equal opportunities for market participants and has not excluded the government from active participation in the industry's development,

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[106] The consolidation decision was also adopted, for example, in Portugal, where previously the industry had a fragmented structure (see, e.g., Jordana, Levi-Faur and Puig 2006).

while, at the same time, contributed to the formation of the oligopolistic foundation for the growing spheres of the new economy.

The "public interest", for example, in the European reform assumed formation of the "Common Market" in the telecommunications field, or what later has been transformed to the "Single Digital Market". Taking into account the incorporated belief about natural monopoly characteristics of telecommunications, and as we have seen above this belief in different forms continued to exist in the policy discourse in the 1980s and 1990s, and the claims that the single European market will allow to benefit from economies of scale, that, according to some commentators of the reform, was not possible within the borders of one country (Koenig et al. 2002),[107] it is easy to assume that the real purpose was to form the pan-European oligopoly with few beneficiaries among the most powerful actors of the industry. As was already noticed in Chapter 1, industry leaders from the most advanced European economies have been able to extend their business in less economically developed parts of the continent. Only deregulation and liberalization were able to open international markets and allow the most powerful global players to extend their operations in the new territories (Clifton, Díaz-Fuentes and Revuelta 2010). Paradoxically, the development of the networks infrastructure in the west of Europe, at the same time, has been lagging behind the eastern European territories (see, e.g., FTTH Council Europe 2012, 2016; Rood 2010; Serdarević et al. 2016),[108] which according to the concept of economies of scale could not benefit from this phenomenon so much.

It is very important to underline that the period of formation of an industry is the most precious time for the rivalry fostering. This is the period of uncertainty, of entrepreneurial risks, of trials and errors that characterize the market process. This is also the period of empty fields and unsatisfied demand that open opportunities and create incentives for newcomers and discipline the leaders if they feel the threat for their positions. In modern telecommunications, this period occurred in the 1990s-2000s, and in many territories around the world, the chance to create a real competitive market that could play for broad public interests and that could function without government support and regulation was missed through the chosen policy of liberalization and deregulation. This choice eventually expressed in the highly-

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[107] The similar notions about importance of economies of scale for the Digital Single Market are presented in the proposal for a European Directive establishing European Electronic Communications Code published by European Commission in 2016 (Available at http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52016PC0590).

[108] See also the analysis of the Russian case in the next Chapter.

concentrated area where the former monopolists have preserved their positions and their control over industry development, and where the most powerful of them have extended their business empires into new territories, forming the global oligopolistic marketplace.

The alternative to the formation of such an oligopolistic field was de-concentration of the industry, elimination of any economic power in the field, promotion of real rivalry between a large number of market participants and total exclusion of the government from the market performance. This alternative was a genuine competitive order that has been ignored by the mainstream theories. As noted by Hayek (1944), "competition … is the only method which does not require the coercive or arbitrary intervention of authority," and, definitely, the results of the reform, where the government is forced to regulate the business of the giants, are extremely far from this ideal competitive regime.

Laffont and Tirole (2000) noticed that "many experts argue that regulation should end once local competition has developed and that regulation should be replaced by standard competition policy,"[109] but the easiest way of formation of local competition was a break-up of local monopolies. If the competition was a target of the reform, then what could be a reason from the public interest perspective to wait for this development of rivalry, when the competitive marketplace could be formed at once? The period when these monopolies were in the hands of the states was the best time for the formation of the competitive order, when de-concentration could have happened without raising the question about government intervention in market mechanisms and collision with arguments about private property. In this connection, Stiglitz (1999), for example, noticed that "wherever possible [privatization in telecommunications] should be preceded by the introduction of greater competition, possibly through the extension of licenses to new private companies or by splitting up the telecommunications company."

The answer to the question is pretty obvious from the public choice view. The real competitive order could never have been among the purposes of the policymakers, just because the groups and individuals that could benefit from the order are not organized and, thus, could not affect the policy. The power of the national telecommunications giants and those groups and individuals that stayed behind the companies allowed them to envisage the new "competitive market" as a marketplace for big corporations in the form of ordered competition. The mainstream

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[109] Among the scholars who shared this position, see, e.g., Littlechild (1983), Burton (1997).

theories with claims about social benefits from economies of scale, problems of bottlenecks and sunk costs, the necessity of efficiency, welfare maximization and so forth, have been useful tools to support the chosen methods of the reform.

Meanwhile, the ideas about the competitive order, elimination of market power and de-concentration of marketplaces, in general, once were very common in the liberal scholarship. They can be met in classical liberalism, libertarianism, earlier views of the Chicago school and German ordoliberalism. Henry Simons in his "Positive Program for Laissez Faire" (1934) argued that in order to force the market to work for the social benefits there are needs to "[e]liminate all forms of monopolistic market power … [and] to include the breakup of large oligopolistic corporations". Aaron Director in his speech to Mont Perelin Society during the founding meeting in 1947 claimed that "[t]he unlimited power of corporations must be removed. Excessive size can be challenged through the prohibition of corporate ownership of other corporations [...] and perhaps too through a direct limitation of the size of corporate enterprise."[110] Hayek (1944) argued that the tasks of the government are "[t]o create conditions in which competition will be as effective as possible, to prevent fraud and deception, to break up monopolies". The ordoliberal school appealed for "creating an economy where production is decentralised and takes place in relatively small units" (Schnyder and Siems 2013). Walter Eucken (1995) pointed out that the size of enterprises affects an economic order, and, thus, a competitive order cannot be based on a system that is dominated by powerful corporations. He argued that the competitive order requires de-concentration and elimination of the positions that warrant the economic power.[111]

Despite of the public spiritedness of these views, they, eventually, have been dropped out, not only from the main discourse of the policy making process, but even from the mainstream part of the liberal scholarship. Eucken criticized Konrad Adenauer's government for their rejection of the crucial recommendations of the Freiburg school (Oswalt 1995, p. 26), but such rejection was a result of vested interests of not only major German industry groups, but also the US administration (Schnyder and Siems 2013). After the shift of its attitude toward market concentration and the provision of eminent "scientific" support for the positions of mega corporations, the Chicago School has become incredibly influential worldwide

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[110] Mont Pelerin Society, "Records of the 1947 meeting" as quoted in Van Horn (2009).

[111] See also the "small is beautiful" idea, that considers "bigness" as the main "cause behind all forms of social misery" and that also appeared in the middle of the 20th century (See Kohr 1957, Schumacher 1973).

and has been admired by many governments. However, this admiration signifies only that such "liberal" ideas can bring enormous benefits for narrow groups with a significant support of such kind of the "pro-market" view, and precisely this mix of private interests with the "pro-market" theory was a cornerstone of the policy of liberalization.

The reasons to adopt the alternative based on the de-concentration and break up of large corporations were, at least, not worse than the reasons to embrace the approach aimed at the concentration of economic power at the global scale. There are no robust grounds to believe that the global oligopolies are better suitable for the purposes of fostering innovations, stimulating investments and development of new services, promoting creation of advanced telecommunications infrastructure, while the alternative would be a solution for the competitive market order and for equalization of opportunities for entrepreneurs in the initial stages of the new economy. There was a chance not only to open the industry at once for competition, but also to destroy any links between industry players and regulatory authorities, while the role of the authorities in this case would be significantly reduced.

Meanwhile, it is clear that this alternative choice was not feasible due to political reasons, and this is not the situation where the public interest doctrine is able to give sound explanations. A similar picture was also visible in other network industries at the period of liberalization, and the outcome was also similar. Richard Green (1996) in his analysis of the British electricity market, for example, pointed out that "[s]plitting up the dominant firms would have more effect [on the reduction in deadweight losses, than the regulator's chosen policy], but is unlikely to be politically feasible." The political environment and vested interests of those who have concentrated the economic power in a socio-economic system do not allow to base policy on the real socially desirable objectives, and this is the answer to the question about the choices of policy makers in the liberalization movement.

3.5. Telecommunications networks and public infrastructure

3.5.1. Public infrastructure for telecommunications development

The importance of telecommunications for economic development has very often been compared with the importance of public infrastructure for the economy (see, e.g., Röller and Waverman 2001). Sometimes the telecommunications infrastructure is even considered as a part of public infrastructure (see, e.g., Pradhan et al. 2014), and it might be explained by the social value of this asset. However, if the demarcation criterion is property rights on the asset, then the application of the term public toward private property seems questionable, even if such property plays highly important role in the life of society. Private property is not open to the public in the way as common or public goods. It might be regulated in order to achieve some public goals, but it is controlled by private entities and this control allows to find ways to exclude others or to determine the way it will be used.

When the telecommunications industry was totally in the hands of the state, and, thereby, in the hands of the public, if, of course, we assume that the state represents the will of the public, it could be indeed to some extent considered as a part of public infrastructure, and in fact it was considered in this way (Grande 1994). The process of privatization has erased this public property connection between the public and telecommunications networks. However, not being a part of the public infrastructure in this sense, telecommunications require the use of the public assets, and competition in the industry heavily relied on opportunities of market participants to get this access. Therefore, it is reasonable to distinguish between telecommunications infrastructure and utilities that are necessary for the placement of active and passive elements of telecommunications networks.[112] In the former case the resource has rather private than public characteristics, while in the latter case, especially when the public has invested in creation of the utility, we indeed are dealing with phenomenon of public infrastructure.

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[112] Strictly speaking, communications cables are passive elements of the networks, and here the private/public line is not between active or passive parts of the networks, but between movable and immovable property, where the cables or junction boxes are the movable parts and the ducts or conduits are immovable. However, the question is not only about the placement of the passive elements. In order to place switches or routers of FTTB networks closer to the subscribers, ISPs also often need access to elements of the public infrastructure.

The problems of the telecommunications infrastructure and its role in the competitive process is that rivalry and development of telecommunications networks depend on understanding of what constitutes this infrastructure and whether it should be in public or private domains. When privatization yielded property rights to the incumbents, not only on the network equipment and cable, but also on ducts and other elements used for cable placement, as well as, on the land where these elements were situated, it created the problem of bottlenecks. Regulation of other network industries and their monopolistic structures impeded possibilities to use other kinds of public utilities for telecommunications networks by independent providers and exacerbated the bottleneck issue.

The alternative for the mandatory local loop unbundling and promotion of service based competition was preservation of public control over the infrastructure that is necessary for placement of cables and other vital elements of the networks, and creation of open access for all parties for which that could be interesting. Moreover, the public spending on telecommunications infrastructure could take a form of enhancements and enlargements of the capacity of such elements, and provision of them for the common use in the same way as other kinds of public infrastructure such as public roads, bridges, parks, etc. If the liberalization erased not only connection between operational and regulatory functions of the industry, but also between telecommunications and public infrastructure in the sense that has been described above, that would have played in favor of competitiveness of the field, encourage investment in telecommunications infrastructure, and better serve social needs.

It is important to notice that the usage of conduits and ducts for cable placement by no means was an approach induced by application of any new methods and technologies that appeared in the industry comparatively recently. On the contrary, even old standards of the Soviet Union allowed to bury cables directly in the ground only in rural territories, providing little exceptions for urban settlements, while, according to some evidence, usage of ducts even for intercity cables in European countries was already in place at least in the 1920s (Huurdeman 2003). In the 1960s, plastic materials became common means of construction of the underground infrastructure and that reduced the costs of the utilities and eased its usage.

The European policy since the end of the 1980s has proclaimed as its objectives the strengthening of competition, stimulation of investment, fostering of consumers'

freedom of choice and "enable them to benefit from innovative services, quality and lower rates",[113] but the richest economies of the EU such as Germany, France, the UK, Italy, Spain failed to achieve these goals if we compare their industry indicators with its counterparts in other places of the world. We have the opposite examples of the east of Europe where such territories as Russia, Slovenia, Bulgaria, Slovakia, Lithuania, Estonia, Latvia are among the continent leaders of the fiberoptic networks development (see, e.g., FTTH Council Europe 2012; Rood 2010; Serdarević et al. 2016). The subscribers in these countries had better quality of the services, at least according to the figures of 2012, for significantly lower prices than the subscribers in the west of Europe, while having, at the same time, more advanced infrastructure.

Some authors argue that the superiority of the broadband development of the Eastern European over the Western European countries in 2010 - 2012 is to a great extent explained by the neglect of esthetic issues in the east of Europe, which, eventually, had allowed aerial hanging of fiber optic cables (Lemstra 2014; Rood 2010). It is necessary to notice that such explanation simplifies the issue. Strictly speaking, the costs of the aerial hanging are the same order as the costs of the underground deployment of fiber optic cables. What really makes a difference between the aerial and underground methods of the deployment is the costs of construction of ducts and other elements that are used for the cable placement.

The same ducts might be used for different kinds of telecommunications cables, copper and fiber, and these cables can be put at the same tubes at the same time. Of course, it depends on a particular method of construction of the ducts, and, in order to cement the problem of bottlenecks, incumbents might roll out duct systems with limited capacity. Otherwise, placement of new cables in many cases does not require extension of the number of ducts, while replacement of a copper cable by a fiberoptic cable does not significantly increase the cost of construction of the passive infrastructure. Moreover, the additional advantage of fiberoptic technology is that the same cable might be used for totally different purposes at the same time: for interconnection of telephone exchanges, for broadband network backbone, for connection of end users, for connection of BTSs and other elements of a mobile network and so on.

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[113] Summaries of EU legislation: Regulatory framework for electronic communications (http://eur-lex.europa.eu/legal-content/ET/TXT/?uri=URISERV:l24216a). See also Green Paper on the development of the common market for telecommunications services and equipment. COM(87) 290, June 1987 http://ec.europa.eu/archives/information_society/avpolicy/docs/reg/tvwf/com_1987_290_en.pdf

Construction of fiber optic lines is significantly cheaper than construction of copper lines, and the low price and simplicity of FTTB deployment are among the major determinants why technologies based on the implementation of fiber have become dominant in the telecommunications markets of the less advanced economies of the east of Europe. The possibility of aerial deployment of the infrastructure provided newcomers opportunity to operate independently from the networks capacity of their main rivals, and this independence, but not the areal wiring per se, was the main factor that facilitated the development of the fiber optic infrastructure.

Of course, there are other theories that explain the difference by replacement effect and lower level of starting conditions (see., e.g., Briglauer and Gugler 2013), but they are mainly explanations of the lack of incentives for incumbents, that, at the same time, have been backed by mandatory sharing of local loops, and that, in turn, hindered incentives for entrants. Indeed, the replacement effect was a problem for incumbents, but, at the same time, it was an advantage for newcomers, but in order to take this advantage they had to be independent in their activity from the main competitors. The opportunity of newcomers to operate independently increases the role of market mechanisms, and from that viewpoint, the main determinant of the difference is the preserved control over alternative development by the incumbents in the advanced European economies, where the ordered competition regime has warranted this preservation.

The “lower starting positions” idea is a useful tool to explain the failure of the policy to foster deployment of Next Generation Access (NGA) networks, but the argument does not match the reality very well. First of all, it is unclear how this approach is able to explain the presence of multiple homogenous fiberoptic infrastructures in the same districts and in the same buildings where legacy copper networks are also present. Secondly, the “lower starting positions” in many places relates to the beginning of the 1990s, while, the growth of FTTB networks, for example, in Russia started in the middle of 2000s. At the moment the argument was already irrelevant to the conditions of the industry. Independent players rolled out their networks in the buildings where incumbents provided their subscribers Internet access through ADSL technology. The economy of the field has given enough incentives for new players to construct their own networks in the same districts that were perfectly covered by copper lines, and as was emphasized above, the main reason for that was their independency from the former monopolist. The lack of this

independency of alternative players disturbs the work of market mechanisms, affects the costs of the roll out, and as a result, preserves inferior technological solutions.

The European policymakers at the end of the 2000s embraced the, so-called, "ladder of investment" (LoI) approach, that was supposed to smooth the way for facilities-based competition and deployment of new infrastructure, and to reduce "the need for future regulation" (Cave 2006). The idea has been criticized from different perspectives (See, e.g., Briglauer and Gugler 2013; Bourreau, Dogan and Manant 2010; Serdarević et al. 2016), but from the point of view of our analysis it is possible to argue that the main weakness of the LoI concept is the same that we meet every time when we face attempts of policy makers to affect the performance of the industry. The viability of competition in this case depends on understanding of policymakers of how the market works, how rivalry can be promoted, as well as on their ability and willingness to act against the interests of large corporations, but not on the competitive order of the industry that does not require any interventions of this kind at all.

The idea of the public interest in the telecommunications reform could be expressed in totally different forms, and some of them could really open the doors for competition. Instead of vertical separation, based on the nature of the services, and promotion of service-based competition, there could be implied horizontal separation before the start of the privatization and then the needs to promote competition would be obsolete because the market could do it better than private interests of policymakers. The underground ducts and conduits could also be split up from the business of state-owned monopolies before the privatization and assigned to the separate organizations, and, after the privatization, market forces would determine the efficient use of these utilities. They could also be preserved under the public control in different forms and regulation could facilitate openness of this infrastructure. Many other possible interpretations of what might constitute the public interest could be found and expressed in the reform, but the dominant economic theories and vested interests did not allow to do so, and the only method to mitigate the favorable decisions for the giants was to find ways to provide newcomers access to other kinds of public utilities for their networks construction.

The aerial hanging of telecommunications cables on facades, between roofs of buildings or on lamp posts or poles could be a possible solution, but in many places of the world this is considered contrary to the public interest because of esthetic issues. However, even in those places where this approach has not been implemented

by newcomers of telecommunications markets we still see on the streets cables of street lighting infrastructure, cables used by public transport, and even elements of legacy networks of telecommunications incumbents. Vivid examples of exploitation of building facades for the legacy copper telecommunications infrastructure are the medieval parts of historical centers of Italian cities where there is an abundance of such solutions. Therefore, the arguments about European "esthetical policies to avoid aerial wiring" (Rood 2010) are not even supported, at least in many instances, by empirical evidence, that, on the contrary, shows the presence of the copper wiring of the established players.

It is absolutely unclear why from the position of social needs the esthetic argument might outweigh arguments about competition, innovation, affordability of services, equalization of opportunities and etc. Moreover, the double standards that allow the aerial use of electric cables and prohibit the same implementation of the fiberoptic makes even more opaque which esthetic solutions better fits the objectives promoted by the policymakers from the position of public interest theory.

The creation of exclusive rights for the incumbents for the passive elements suitable for cable placement, supported by regulation of other network industries and esthetic policies, have been perfectly supported by the public interest paradigm, but the results of such policy in many places are preservation of legacy technology, lower indicators of fiber networks development and high concentration of the industry. However, it would be much more reasonable to expect that the public interest required a completely different regulatory regime, and, therefore, could be expressed in alternatives ways of deregulation and liberalization.

3.5.2. Wasteful duplication and efficient use of resources

In general, the theory that local telephone networks has been subject to considerable economies of scale and, thus, represent examples of natural monopolies might be considered as a result of difficulties of social sciences to check the hypothesis by an experiment. Moreover, if the economies of scale were unsuitable for the explanation of the economics of fixed telephony services, we cannot be sure that technological advances will not or even have not already changed the economics of the industry and that this old hypothesis should be totally removed from the analysis. The idea about social significance of telecommunications services that

considers access to telecommunications as some kind of human right can be treated as an example of the old debates about socialist and liberal way of society organization.

Meanwhile, the domination of the idea about the necessity of efficient use of resources and the necessity of a policy aimed at the prevention of "wasteful duplication", that found implication in regulation of telecommunications, stems from the utilitarian traditions according to which economics should give us the answer about the most efficient way of using limited resources. However, even if one suggests that the public interest allows to suppress individual liberty for the sake of efficiency, the history of telecommunications reveals us that such suggestion is based on fragile assumptions and theories. Innovation and dynamic efficiency sometimes makes unavoidable some kind of static waste, and, thus, market forces are able to filter out inefficient use of resources in the growing industries of the new economy.

The mainstream has never considered as examples of inefficiency the production of luxury goods that amuse those who enjoy monopolistic positions of their businesses protected by regulation, while private investments of independent entrepreneurs into their own private enterprises, when these enterprises could operate in the network industries, were deemed, and are still often considering, as undesirable from the position of the public interest, because they might duplicate the assets that already exist and possessed by the major players. The result of such "public interest" decisions is underinvestment in the industry, deadweight loss, and it hardly fits even the utilitarian ideals of efficiency. Meanwhile, in the contemporary literature there are many discussions that express the following concerns:

"Competition between parallel infrastructures incorporates opposing welfare effects. The gain from reduced deadweight loss might be outweighed by the inefficient duplication of an existing infrastructure" (Höffler 2007);

"…platform competition may … lead to negative results if gains from the reduced deadweight loss due to higher competition are outweighed by the inefficient duplication of an existing infrastructure" (Picot and Wernick 2007);

"the regulator must take into account potential conflicts between investment incentives, static efficiency in uncovered areas, and excessive duplication of infrastructure costs" (Bourreau, Cambini and Dogan 2011).

The direct prohibition of investment that might be considered as wasteful has been substituted during the "liberalized" period by the form of encouragement of usage of existing infrastructure. Judge Breyer in his opinion in AT&T v. Iowa Utilities Board (525 U. S. 366 (1999)) argued that provision of access to network

elements for the newcomers "on an unbundled basis" facilitates new entry "in respect to some aspects of the local service business without requiring wasteful duplication of the entire business." From this point of view the local loop unbundling policy is a method to prevent the wasteful duplication in telecom infrastructure through soft means (Bamzai 2004).

When the market has a real competitive form, when no one possesses the power in the market and no one controls the crucial resources, there are no justifications for the state to use its coercive and arbitrary power, and only market mechanisms determine the usage of available resources. The necessity to stimulate investment appears when it cannot be done by the market, often because the competitive order has not been formed by the government, and, in such a case, it forms a fertile environment for rent-seeking behavior and results in underinvestment and underdevelopment. The concept of wasteful duplication has always been an important element in the prevention of formation of the real competitive order, and even when it took a soft non-prohibitive form, it, nevertheless, has affected the performance and landscape of the industry.

The problem again is what exactly the public interest means, and, depending on the answer to this question, it is possible to argue that there is no place for the trade-off induced by the duplication. If the duplication provides such benefits as "a higher variety or quality of service" and more intense competition (Bourreau, Cambini and Hoernig 2015), then what is society losing if the resources are allocated for the "inefficient duplication of an existing infrastructure"? In the world of planned economy, the answer is clear, just because the resources are totally controlled by a central authority and the duplication means direct losses of other goods or services, but in the realm of market economy, where resources are in the private domain, we can only hypothesize that if an entrepreneur is prevented from using his own private resources in the way he prefers to use them, then the alternative use will be more beneficial for the society. In other words, this trade-off might be represented as high variety and good quality of services, competition and reduction of deadweight loss, and some hypothetical social benefits from some other implementation of the talents and resources of the entrepreneurs.

Moreover, since the future benefits of the use of a facility, even if it replicates existing resources, cannot be known in advance, the effect of market performance on the ground of the modern understanding of the efficiency is able to undermine the dynamic effects. Innovation and investment are not predictable ex-ante in the real

market economy, and if a society desires to have benefits of a market system, then the static wastefulness of private economic activity should not be taken into account in the policymaking process.

Apart from the hypothetical social costs, the "inefficient duplication" has very clear private losses. Competition merely signifies reduction of monopoly profits and this is the tangible price that is paid by the owners of monopolies for such "inefficiency", raising the question about Pareto optimality; and, thus, it might be argued that this is the main cause why regulation of the telecommunications industry has always taken into consideration the problems of wasteful duplication and efficiency of the use of private resources. If we leave aside public interest theory and look at the requirements to obtain for network development a "certificate of public convenience and necessity"[114] or at the way of the "liberalization" of the industry, then it becomes clearer why these requirements existed or why the "liberalization" prohibited competition by infrastructure during the first stages of the process.[115]

As was noted above, the modern passive telecommunications infrastructure does not represent an asset with high fixed costs if we do not look at the network as a whole.[116] What really has sense is difficulties to get access to public utilities that is necessary for the cable placement. Public investment in this infrastructure might lead to real waste when it generates private control over the formed assets, and indeed we have to admit that the duplication of ducts or poles constructed through public spending is a real problem of social costs. If the infrastructure has been formed by the public, then it could be preserved in the public domain in an open uncontrolled by any private entities form, and regulation could maintain this openness and accessibility of the utility to all market participants, and by that means discourage the wasteful duplication, making it absolutely unnecessary.

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[114] See the analysis of such requirements, e.g., in Thierer (1994).

[115] The regulatory model of the 1987 Green Paper that was in place until 1996 did not envisage competition by infrastructure. Even if we assume that the European policymakers tried to introduce the competition as soon as possible, this delay, nevertheless, is better explained from the public choice view.

[116] Earlier we drew the line between movable and immovable infrastructure, and from this point of view, the movable part that includes cables, junction boxes, etc. does not represent an asset with high fixed costs, while if look to the infrastructure as a whole, i.e. not only at cables, but also at ducts, conduits, and so on, then the fixed costs are really high.

3.5.3. Public subsidization of the private means of production

The interesting phenomenon that we observe in the liberalized period in the telecommunications development in totally different world economies is public spending on the development of private means of production. These subsidies are not examples of government aid to the poor; on the contrary, they represent direct investment of public resources in creation of private assets that generate profits for rich and successful individuals,[117] but the main justification of this activity is always a necessity to achieve some socially desirable goals, that, allegedly, cannot be achieved by the market. Such intersection of private and public interests, the interests of individuals who receive the public support for their business and interests of the public due to the growing economic activity, induces reasonable questions about the necessity of the chosen approach. In other words, is the public investment in private means of production a necessary condition for the achievement of the established goals, and do the established goals really fit the public interest? In order to highlight the issue, the private benefits from the public policy and the possible alternative that could play in favor of contestability of the broadband markets, we can look at the practice of state participation in the network development in the EU and the goals that justify the decision making.

The European approach of the public support of telecommunications development is the consequence of the liberalization that has preserved power in the hands of the giants. On the one hand, the approach is warranted by the inability of the highly concentrated market to sufficiently develop the industry, but, on the other hand, it is based on the same idea of the European policy that infrastructure represents a bottleneck and that the access to the infrastructure might be regulated, and, thus, the public support does not necessarily form impediments for competition. Community Guidelines for the application of State aid rules of the European Commission (2009/C 235/04) even claims that "[i]n particular State aid can correct market failures, thereby improving the efficient functioning of markets and enhancing competitiveness". At the same time, the potential negative impact that might represent state interventions of this kind is also widely recognized by the European

[117] Even when after privatization a significant part of a company has been preserved in the hands of the government, it does not mean that these assets do not form private benefits for particular individuals. The private interests approach points out that preservation of significant parts of the former monopolists in the "public hands" might be explained by the higher level of rent incomes of the top-executives than they could have in a private property regime (Laffont 2005; Radygin, Simachev and Entov 2015).

policy. The policy has more favorable view towards the state participation in broadband deployment in rural and underserved areas, whilst being less enthusiastic towards aid measures in areas where there are some forms of competition and where a broadband infrastructure already exists (2009/C 235/04).

According to the core provisions of the Treaty on the Functioning of the European Union (TFEU), state aid which distorts or threaten to distort competition is considered as incompatible with the internal market of the EU. However, Article 107 (3) of the Treaty provides some exceptions from the rule, or, more precisely, the instances which "may be considered to be compatible with the internal market", and the modern view on the socio-economic value of telecommunications network, supported by the concept of digital divide and by understanding of telecommunications as a main driving force of economic development, provides justifications to use such exceptional cases for state measures. Over the period from 10-12-2003 to 30-06-2016 the European Commission made 148 Decisions on State aid to broadband, and the vast majority of them has been approved by the Commission.[118]

For example, the "High-speed broadband in Portugal" project, approved by the European Commission on 19-01-2011 (State aid SA.30317 – Portugal), is justified by the opinion that the "measure will offset a geographical and commercial handicap and … to address the lack of availability of very high speed broadband services due to the commercial unattractiveness of upgrading existing broadband services." At the same time, from the document it is clear that market mechanisms are unable to work in the field because "in the targeted areas only one basic broadband infrastructure is present (belonging to the incumbent operator, Portugal Telecom)" and, as a consequence of it, the market share of "the median proportion of customers that are currently served by alternative operators (via bitstream access products) is a mere 1.63% of the population." The alternative to provide "very high speed broadband services" could be to change the market structure, and instead of the "one basic broadband infrastructure" belonging to Portugal Telecom, the intervention could be

[118] The approved amount of the aid exceeds 20 Billion Euro, and this figure does not include such measures as taxation holidays, soft loans or additional grants. Moreover, some countries, such as Germany, has been able to obtain some kind of a "wholesale" approval without putting any figures in the documents (see, e.g., State Aid SA.38348 – Germany (NGA Germany)), and the figures in some of the decisions have been hidden under the pretext of "professional secrecy", what makes difficult the assessment of the measures (see, e.g., State aid SA.39518 (2014/N) - Germany - NGA Cluster Nordhessen; State Aid n° N 559/2009 – United Kingdom North Yorkshire – Next Generation Broadband; State Aid n° N 475/2007– Ireland National Broadband Scheme ("NBS")).

aiming to provide multiple infrastructures that could establish real competitive market, but in the document, we see that one of the numerous "necessary conditions" is "[t]o avoid unnecessary and wasteful duplication of resources."

Similar pictures emerge in a number of others decisions approved by the European Commission. The same claim about the necessity to avoid wasteful duplication is, for instance, in the Greek project of "Metropolitan Area Networks (MAN)/Fibre To The Home (FTTH) Greece" (State aid SA.33641 (2011/N) - Greece) approved by the Commission on 30-11-2012. In this document, we can find that the objectives are not only expressed in speed characteristics of the broadband network, but also in the requirements of the network architecture — the government of Greece is aware of that FTTH is better suitable to meet the needs of the society than other approaches to broadband deployment. The country, where the largest shareholder of the main telecommunications asset is German giant Deutsche Telekom AG,[119] has participated in the state assistance of the broadband development since 2000 when the Operational Programme "Information Society" was adopted by Decision E(2000)3405 of 28-11-2000. Within the Programme the Greek government financed the rollout of 72 fibre optic networks in the main cities (not even in rural areas) of the country. Then, there have been projects of broadband deployment approved by the European Commission in 2006[120] and 2011,[121] and in 2012 the government acknowledges that private operators "besides the incumbent … lack the appropriate infrastructure" for service provision for public needs.

The notions about "wasteful duplication" are also common in the homeland of the main shareholder of the Greek telecommunications network.[122] About 21% of Commission decisions on State aid to broadband (31 of 148) are related to the largest European economy — Germany —, where the former state-owned monopolist due to the lack of real competitive pressure has not had enough incentives neither to upgrade its network, nor to provide sufficient services in the entire territory of the

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[119] Financial Times in the article dedicated to the acquisition of a strategic stake in OTE by Deutsche Telekom in May 2008 pointed out "the billion-euro bribery scandal at Siemens", that has been one of the leading equipment suppliers of the Greek company (Available at https://www.ft.com/content/788e2810-1a04-11dd-ba02-0000779fd2ac). About the Siemens bribery scandal and relationships between Siemens and Deutsche Telekom see also Financial Times (May 31, 2007. Available at https://www.ft.com/content/fe48d6e6-0fb8-11dc-a66f-000b5df10621) and Spiegel Online (January 29, 2007. Available at http://www.spiegel.de/international/siemens-bribery-saga-new-report-details-far-reaching-corruption-a-462954.html).

[120] N 201/2006 - Broadband access development in GR underserved territories

[121] SA.32866 (2011/N) - Broadband development in GR Greek rural areas.

[122] See, e.g., "NGA Germany" (State Aid SA.38348 – Germany)

country. At the same time, the company has been able to invest billions in the foreign assets, while the substantial support for development of the home infrastructure as well as for development of the acquired assets abroad has been provided by the public.

An interesting example of state measures in broadband development among comparatively recent approvals might be found in Spanish Programa Avanza Nuevas Infraestructuras de Telecomunicaciones, for which in 2013 the European Commission approved an extension (State aid SA.35834 (2012/N) – Spain). The peculiar characteristic of this state measure is that the notion that rural areas are not commercially interesting for market participants is extended in the program to the areas where population "must be inferior to 50.000". In such a case, the state aid assumes that people in these areas should have "very high speed broadband (more than 100 Mbps)." The measure in the same way as examples above assumes that wasteful duplication must be avoided and, thereby, "expressly foresees that ***existing infrastructures*** will be used wherever available for the deployment".[123] The budget of the measure is 360 million Euro over a three-year period, and for the authors of the document it is clear that such amount "has the potential to distort competition … [and] … may discourage other competitors to deploy or expand their own networks in the targeted areas", but since the aid is aiming at the objectives of the modern EU policy expressed in the Digital Agenda with potential "to bridge the 'digital divide' ", the decision of the Commission is that the program is compatible with Article 107(3) (c) TFEU.

Meanwhile, it can be argued that the alternative for this common approach might be the development of a public part of telecommunications infrastructure as it was determined above without establishment of any goals and limitations for the market participants. Moreover, it is reasonable to suggest that the existing approach hardly can be explained from the position of the public interest, and it is possible to distinguish three main general issues in the analyzed state measures that support this claim. The first problem is that after the measures the infrastructure is placed under the control of particular market actors, and it prevents the open use of the publicly formed assets by everyone. Even if the government will try to facilitate the openness, the lack of independency and the necessity to rely on the government actions stifle the ability of real market forces to govern the field.

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[123] The text in bold and italic is in the original document.

The second problem is that the policymakers assume the existence of underdeveloped regions as an examples of market failures, while the real issue is inability and unwillingness of the government to create a real competitive marketplace. The lack of the competitive order is the consequence of the policy, and, therefore, this subsidization is not more than an attempt to solve the problem of government failure by the means that cannot contribute to the formation of a sustainable competitive market.

The third problem is the tendency to avoid unnecessary duplication. Even if this aim has a reasonable ground, it again provides privileges for the giants. When an incumbent already possesses an infrastructure, but needs investment in order to upgrade or enhance the existing asset, that means that construction of a network from zero starting conditions for newcomers put them at a disadvantage compared to the established player. Even when the regulator tries to force the incumbent to share the facility and, thereby, allows others to participate in the bid with the reliance on the existing infrastructure of the incumbent, it does not form the genuine competitive order due to the lack of opportunities for independent activity.

As was noticed in the previous sections, the liberalization did not envisage formation of the pluralistic telecommunications market, and as a result, the European policy, that has a strategy of promotion of rivalry as one of the publicly accepted objectives, has always tried to invent how these pro-competition goals might be achieved when the industry is controlled by companies with significant market power (SMP). The chosen response to the SMP is to regulate the companies that have this power rather than to eliminate it by splitting up the giants to a number of small enterprises. It is necessary to notice, and this note might be backed by the evidence from the east of Europe, that when a broadband access market has sufficient pluralistic form, any needs to promote competition, including local loop unbundling, promotion of the ladder of investment idea or wholesale access regulation, are totally obsolete.

When there is a market of wholesale access and when this market includes a number of players, then market mechanisms determine prices and conditions of interaction of all market participants, buyers and sellers, in the same way as the market does it in other fields — telecommunications in this sense are not an exception from general market rules. When local loop does not represent a bottleneck, when anyone has opportunities to construct own lines toward the subscribers, then there are no reasons to regulate access to these lines. The public

support could be helpful to solve the problem of the bottleneck through formation of the accessible infrastructure and that could be an alternative to the chosen way.

Moreover, at the same way as construction of public roads does not constitute state aid, the construction of public ducts, public poles or whatsoever that could be useful for the network deployment by no means could be considered as a threat to distort competition. On the contrary, in such a case it really might be argued that the state is acting in the public interest, forming public resources that accessible to everyone and no private undertaking receives any economic advantage compared to its rivals. This approach does not constitute any intersection of the public interest and private interest of those who directly obtain the benefits of such subsidies, and, thus, does not raise an issue of state aid under EU law.

As was discussed above, the telecommunications infrastructure is comparatively cheap and arguments that fiberoptic networks are expensive do not reflect reality. However, the infrastructure that is necessary for the cable placement is expensive, and it is controlled by incumbents, who without competitive pressure have no incentives to upgrade their networks. The usage of public support for the incentives formation is not the best choice. On the contrary, the public takeover of the ducts, poles, land and other necessary elements for the network development and openness of all of these elements not only to telecommunications enterprises, but to anyone who is interesting in their use, could increase the contestability of the field and, thus form the incentives for development. The support can be aimed on construction of new elements and development of this passive network to new territories, that in the open form could be used in the same way as public roads, parks, bridges and so on, and will provide incentives for weak players and threats for the strong. The role of regulation is to facilitate this openness and competitiveness. Interestingly, the European projects mentioned above are all aimed on the openness and competitiveness according to their objectives, but they assume this openness under the control of private entities, while the evidence highlighted in section 3.5.1. expose that independent competition plays better for development and innovation. This independent activity should not be controlled neither by incumbents nor by governments, while the entire European experience of the ordered competition regime promoted by governments and controlled by established players has locked the market on the legacy inferior technology, high prices and underdevelopment.

Looking at the issue from private interests positions, it is easy to infer that the state participation in the network development is the deliberate consequence of the

liberalization policy, that has envisaged oligopolistic environment of trans-national markets, favorable for foreign expansion of the business of the giants; and current subsidization practices not only allow to indirectly use public resources for this expansion, but also protect the established status quo from any threats that could be brought in telecommunications by the market process.

3.6. Summary and conclusion for Chapter 3

The public interest approach as a ground for interventions in the telecommunications industry has not been limited to economic rationales and widely exploited ethical, paternalistic and other non-pecuniary justifications. Moreover, it might be noted that in many instances the ground for interventions has been based on different explanations at the same time. The "social justice" view on provision of telecommunications services for the poor and the disadvantaged has been supported by the market failure rationale of economies of scale. The paternalistic appeals to inclusivity of different social strata into the growing information society has been backed by the problem of high sunk costs that has provided justifications for public subsidization of the network development.

At the same time, there are two major anomalies that create difficulties for public interest theory. Firstly, the existence of the market failure problem in the form that it has been incorporated in the supporting theories might be challenged by the empirical evidence. It is possible to argue that competitive market in the industry has been possible and could provide more efficient solution for a number of non-economic issues such as affordability of services for the poor or reducing digital divide, while the interventions have aggravated the problems and have increased demand for regulation.

Secondly, public interest theory does not explain the chosen ways of regulation and de-regulation. Policymakers had various alternatives and different tools that could change the structure of telecommunications markets and affect implemented technologies and even architecture of the networks. Such alternative structures, if they were based on openness, accessibility of public utilities and resources, activity of small and medium-sized enterprises in the absence of players with significant market power, could be able not only affect technological development and innovation, but also distribution of wealth in the modern society.

The liberalization reforms, that took place at the end of the last century, have been started on the international level and exploited the idea of free trade, but not the aim of de-concentration of economic power. The former concept has been a lucrative endeavor for powerful international groups or for those who was seeking to extend their economic and political power in new territories, while the real competitive order has always required efforts in the both directions. What we really observe now is that free trade without de-concentration of the markets aggravates the problem of inequality and contributes to the growth of socio-economic problems. The chance to change the landscape of the industry and to transform this former monopolistic field to the competitive ground for the new economy has been missed, and the current trend towards a global oligopolistic marketplace yields an unprecedented amount of economic power to narrow groups at the global scale.

The current analysis allows to argue that in these spheres where explanations of public interest theory are not so robust and clear, the more plausible answers might be found in public choice. The history of telecommunications and the recent surge of "liberalization" of the industry speak rather in favor of the hypothesis of vested private interests in the policy and that they have always been greatly covered by the sauce of public interest justifications. "Liberalization", "deregulation" or "demonopolization" of the industry in many places of the world have never actually signified the literal meaning of these words and have been used in order to legitimately transform public property into private hands and to extend the boarders of business empires of the most powerful actors of the global telecommunications market. Of course, it has provided some public benefits, but such benefits in line with the statement of Milton Friedman (2009) that "private monopoly" is "the least of the evils" in comparison with "public monopoly". The results of the reform indeed introduced the market mechanisms in the industry, but the real free and open market has never been formed, and it is possible to assert that it has never been among the real objectives of the public policy.

The very important conclusion from the analysis above is that the private interests of the most powerful groups have always been able to find ways to justify the interventions through existing economic theories. On the one hand, Keynes, in the words that are presented in the epigraph for this chapter, is right that power of ideas of economists and political philosophers in public policy is very significant. The case of telecommunications shows that ideas and understanding of economic phenomena played an important role in adoption of regulatory regimes. On the other

hand, it is also apparent that people on the top of the social pyramid have opportunities to pick up and foster those ideas that better fit their private needs. Moreover, they also have instruments to support and nurture the academic perception of social issues in direction that is favorable for them. The only way to exclude this impact is to minimize the power of the concepts that can affect public policy. Withdrawal of the state from participation in the market process is one of the essential elements of such an endeavor. Even promotion of competition is a dubious goal, if the state tries to achieve this goal through regulation of the market process in accordance with prevailing theories of contemporary economics. The next chapter expose how the market can facilitate creation of a competitive environment. However, it also shows that the market requires the state participation, but not in the process, in formation of starting conditions and institutional frameworks where the market can realize its potential.

CHAPTER 4

The Russian Telecommunications: A Positive Outcome of the Competitive Order in the Industry

"The only thing that saves us from the bureaucracy is inefficiency.

An efficient bureaucracy is the greatest threat to liberty."

Eugene McCarthy, Time Magazine (12 February 1979)

4.1. Introduction to Chapter 4

The telecommunications industry has been considered as an example of a natural monopoly over the major part of the 20th century. Even when the pro-market ideas penetrated industrial policy during the last decades of the century, the understanding that not all layers of the industry are able to have a competitive form governed the "liberalization" process and was expressed in a new regulatory environment, a new role of the state in the industry's development and different methods of promotion of rivalry through regulatory tools. At the same time, the biggest telecommunications market of Europe, the Russian Federation, since the collapse of the Soviet Union, has demonstrated comparatively low level of concentration in many of its parts without any genuine attempts to promote competition at all. The industry in Russia has been a place for the introduction of a

number of innovative solutions by local and regional market actors despite weak state institutions, a high level of corruption and an industrial policy that has been hostile to independent innovative activity. Russian telecommunications have showed one of the best figures of FTTx networks development in the world in spite of the absence of essential government support of its construction. Together these factors allow to assume that the mainstream theories of the economics of telecommunications are not able to reasonably explain such an anomaly.

Joseph Stiglitz (1999) even notices that Russian telecommunications pose "quandaries for traditional economic theories". However, it is not entirely clear whether some features of the Russian market distinguish it from the other examples that have been explained by the economic mainstream, or the mainstream theories have been based on fragile assumptions, that, in turn, had been the result of the previous ways of the industry development under the close supervision of the states all across the world. The Russian experience, where the industry to a large extent was left to itself for several years in the beginning of the reform, demonstrates how market forces were able to govern the development of the field without close supervision of the state, and that makes the case particularly interesting for analysis.

One of the most remarkable features of the Russian socio-economic system is the absence of democracy[124], the lack of the rule of law[125] and total corruption of all state institutions that does not allow to apply "public interest theories" of regulation to the analysis, while "private interest theories", that are very skeptical of "public interestedness" of policymakers and stress the tendency of regulation to promote interests of narrow interests groups (Morgan and Yeung 2007), provide plausible explanations of the real intentions of industrial policy. An EBRD (1999) report concerning the transition period of Russian economy in the 1990s claims that the Russian "system controlled by oligarchs … may foster a culture of corruption and regulation that stifles competition instead of rules designed to provide fair conditions for all market participants." However, the direction of the industry development in Russia in the 1990s and 2000s was able to provide benefits for a wide range of social strata. Therefore, we can assume that either this is the case when private interests that shaped the captured policy have coincided with the general social interests,

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[124] According to Freedom House, Russia changed its status form "Partly Free" to "Not Free" in 2004-2005. Information available at https://freedomhouse.org/report/freedom-world/2005/russia

[125] According to the World Justice Project, Russia has rank 92 among 113 analyzed countries in the WJP Rule of Law Index 2016. The report is available at https://worldjusticeproject.org/sites/default/files/documents/RoLI_Final-Digital_0.pdf

which per se looks very dubious, or that the state could not manage to efficiently enforce the privately beneficial regulatory norms, and, thereby gave a chance to market forces to govern the field.

Exploitation of loopholes, creative compliance, usage of system mechanisms against the system, cheating and manipulation of the rules in order to get desired outcomes can be considered as different practices of "gaming the system". This phenomenon can be studied from various viewpoints and in different contexts. Dogan and Lemley (2008), for example, looking at the issue from the positions of antitrust, point out that "the very regulatory structure that exists to promote competition can create gaming opportunities for competitors bent on achieving anti-competitive goals". At the same time, if regulation per se aims to stifle competition and promotes the interests of particular groups in society, then attempts of others to game such a regulatory regime allow them to survive in the market, make the market structure more competitive rather than it was desired by the elite of the industry, and, thus, contribute to the economic development and growth of social welfare.

The theory of regulatory capture assumes that regulatory agencies are not necessarily "benevolent maximizers of social welfare" as presumed by the "public interest" theory (Laffont and Tirole 1991), but maintain interests of, so-called, "interest groups". In a more general view, regulatory policies are formed in the interests of those who have access to their formation (see, e.g., North 1994; Buchanan and Tullock 1999; Stigler 1971), and, thus, if political power is distributed among different groups of society, the regulator is forced "to arbitrate among competing interests" (Laffont and Tirole 1991), while in the absence of democratic institutions, and Russia represents this particular case, these "competing interests" are concentrated in the hands of small groups and do not encourage officials to act in the interests of the public.

However, when the regulatory structure creates gaming opportunities for "weak" actors in the market, this does not mean that such phenomenon has solely negative consequences. Moreover, such kind of regulatory failure allows to explain why in the presence of "captured regulation", corruption and lack of democratic institutions the economic system, nevertheless, is able to provide benefits to the general public.

Implementation of this approach in the analysis of the telecommunications industry in Russia allows to explain why, despite the tremendous level of corruption, some indicators of the development of Russian telecommunications are better than the same indicators in more democratic parts of the world (see, e.g., FTTH Council

Europe 2016). The Russian telecommunications sector is full of examples that allow to examine the case from two opposite sides: how the regulation protected interests of the powerful players and how others were able to find ways to circumvent these norms. The inability of the regulator to enforce the main regulatory frameworks allowed market mechanisms to govern the industry, that, eventually, promoted facilities-based competition and expressed in a big number of market participants, good indicators of the infrastructure development and innovations.

The chapter begins with a review of the literature dedicated to issues of telecommunications development with particular attention to cross-country differences. This part also provides some insight in the peculiarity of the Russian institutional environment that had a broad impact on the industry's performance. The next section is dedicated to the review of the initial process of the market reforms in the industry, includes a general observation of the process of privatization of telecommunications in Russia and introduces the main landmarks of the landscape transformation of the field. The peculiarities of the process of privatization of telecommunications in Russia allow to claim that the process was much closer to the Austrian view at "spontaneous privatization" than the European "state-led privatization" approach. Then, the chapter analyzes the interplay between private interests incorporated in the regulatory policy and independent economic activity in the industry that was able to pass around the severe regulatory requirements. This section is constructed around the timeline of the industry development linked to the milestones of the evolution of the former Soviet monopoly and provides the main argumentation of the research. The empirical examples of this part explain how and why the decentralized industrial structure and independent entrepreneurship are able to satisfy actual social needs, while interventions in the market process tilt the industry toward concentration with negative consequences for its development.

4.2. Review of the literature and cross-country differences

4.2.1. The role of regulation in telecommunications development

Since the last decades of the 20th century, telecommunications policy has adopted a course on the promotion of competition and stimulation of investment and

innovation, and one of the major challenges that arose before the policymakers was, on the one hand, to open the doors of the industry for newcomers and to enable consumers to benefit from the diversity of the services and low rates, but, on the other hand, the policy should not discourage market participants from the development of their networks. Cambini and Jiang (2009), for example, remark that "[t]he tension between promoting competition and promoting investment has been noted widely in the telecommunications economics literature".

Since the industry had long been recognized as an example of a market with natural monopoly characteristics, the opportunity for competition was initially sought only in some parts of telecommunications, while others remained under the control of incumbents (Yoo 2011). Meanwhile, Spulber and Yoo (2013), point out that there has not been agreement among empirical scholars about subadditivity of local telephone services. Faulhaber (2003) complains that "the "natural monopoly" thesis … was never actually put to a market test", and some scholars even argued that in the telephone industry "there was no evidence of economies of scale, … contrary to the standard account of the theory of natural monopoly" (DiLorenzo 1996).

Nevertheless, the "natural monopoly" paradigm, supported by the aims "to avoid inefficient investment duplications" (Cambini and Silvestri 2013) and, at the same time, by the objectives to promote market mechanisms in the field, influenced industrial policy at the initial phase of "liberalization" and expressed in the idea of fostering service-based competition depended on the mandatory access to the incumbents' infrastructure (Yoo 2011). This approach has been widely adopted in EU regulatory policy, but, nowadays, the growing body of the literature dedicated to the analysis of the connection between industrial policy and development of telecommunications networks points out that the countries where efforts on promoting service-based competition were more successful show lower indicators of development of, so-called, Next Generation Access Networks (NGA). For example, Briglauer and Gugler (2013) argue that the current EU regulatory framework is likely to lower investment in NGA infrastructure, while Yoo (2014) explicitly points out that the European approach had a negative effect on the broadband investment. The claims that regulated cost-based access charges to incumbents' facilities reduce the investment incentives for incumbents, as well as, for new entrants might be found in a number of contemporary studies of the field (e.g. Jorde, Sidak, and Teece 2000; Yoo 2011; Crandall, Jeffrey and Ingraham 2013; Cambini and Jiang 2009).

As an alternative to the European approach, modern telecommunications researchers often distinguish either a US market-driven strategy, or an Asian model, where the states actively participated in the development of the networks (e.g. Briglauer and Gugler 2013; Cambini and Jiang 2009). The Russian case that analyzed in the present chapter, on the one hand, has some similarities with the US model because market forces have played a major role in the development of the field, but the totally different institutional environment, starting points and the pace and trajectory of the evolution of the industry, on the other hand, put the Russian example into a separate category of the models of telecommunications development. Moreover, it is interesting to notice that according to different studies, the roll out of FTTx networks in Russia outperformed the North American telecommunications sector (e.g. Briglauer and Gugler 2013; FTTH Council Europe 2012; FTTH Council Europe 2016), and if in both cases the industry has been mainly governed by the market rather than by regulation, then it also makes the Russian case particularly attractive for the analysis.

4.2.2. Case studies and cross-country differences

The evolution of the industry in different parts of the world has occurred in different ways, and there is a growing attention in modern literature dedicated to the analysis of economics and regulation of telecommunications to the causes, institutional features and scope of this diversity. There is a number of attempts to make comparison between development of telecommunications networks in the US and the EU, and, again, the discussion often goes into comparison of benefits of service-based and facility-based competition (e.g. Yoo 2014). However, even within the EU member states, there are different indicators of the broadband development, competition, market landscape and implemented technologies.

Lemstra and Melody (2014) provide important insights into the industry's differences in European countries, presenting an analysis of 12 EU member states. The analysis of Western European cases is augmented by studies of Poland and Latvia, and shows that the networks development in different parts of Europe had "a different trajectory and pace".

Some Northern and Eastern parts of Europe show better figures of FTTx development than the advanced economies of Western Europe and North America.[126] Such countries as Germany, France, Belgium, Austria or the United Kingdom are among the outsiders of the fiber networks development among the European and OECD countries (FTTH Council Europe 2016; OECD 2015). Briglauer and Gugler (2013) notice Sweden, Denmark and Norway as "Northern European Fiber Nations" and point out that this phenomenon is explained by "a long-lasting history of broadband state aid", and such government participation in the broadband development resembles the strategy in Japan and South Korea, that might be considered as "the most mature fiber nations" (Briglauer and Gugler 2013). However, not all territories that have been able to facilitate development of fiber optic networks relied on governmental aid, and, moreover, the population density, which has a significant impact on the deployment of FTTx infrastructure, of the east of Europe is noticeably lower than the density of the Asian frontrunners.

Serdarević et al. (2016) expose dissimilarity of telecommunications development in Western European countries and Central and Eastern European (CEE)[127] countries of the EU, and clarify why newcomers of telecommunications markets in CEE countries were able to invest in their own networks without reliance on the incumbents' facilities. The examination of the Bulgarian case by Rood (2010) contributes to the explanation of the superiority of FTTx development of some of the Eastern European countries compared to the more economically developed parts of the EU and points out "esthetical policies" as one of the reasons "why Europe trails other countries in new infrastructure roll out".

The results of these studies of the Eastern European cases correspond with some of the features of the evolution of telecommunications in Russia: the roll out of FTTx networks through the aerial deployment of fiber optic cables, the underdevelopment of the incumbents' infrastructure at the moment of the start of the reform accompanied by the shortage or even lack of cable TV-operators in the markets and the high unsatisfied demand. However, the lower population density and the large distances between industrial centers of the country, the climate, the

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[126] See, e.g., the comparison in Briglauer and Gugler (2013), FTTH Council Europe (2016), Serdarević et al. (2016). For the analysis of the Canadian case see Rajabiun and Middleton (2013).

[127] Serdarević et al. (2016) define by the term CEE countries Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, Slovenia, Bulgaria and Romania. Four of these countries in 2015 were among the five EU member states whose FTTx penetration exceeded 20%.

institutional environment and an immense level of corruption distinguish the Russian case from its Eastern European counterparts.

The level of development of FTTx networks in Russia and in the aforementioned leading European FTTx countries is represented in Figure 1. As for the end of September 2015, the highest household "penetration rate"[128] of FTTx solutions in Europe was demonstrated by several CEE countries (Lithuania, Latvia, Romania and Bulgaria), two of the "Northern European Fiber Nations" (Sweden and Norway), and by Russia. No other European country[129] was able to show the penetration rate higher than 20%. For comparison, the penetration rate in Germany and Italy just slightly exceeded 2% threshold in 2015 (FTTH Council Europe, 2016).

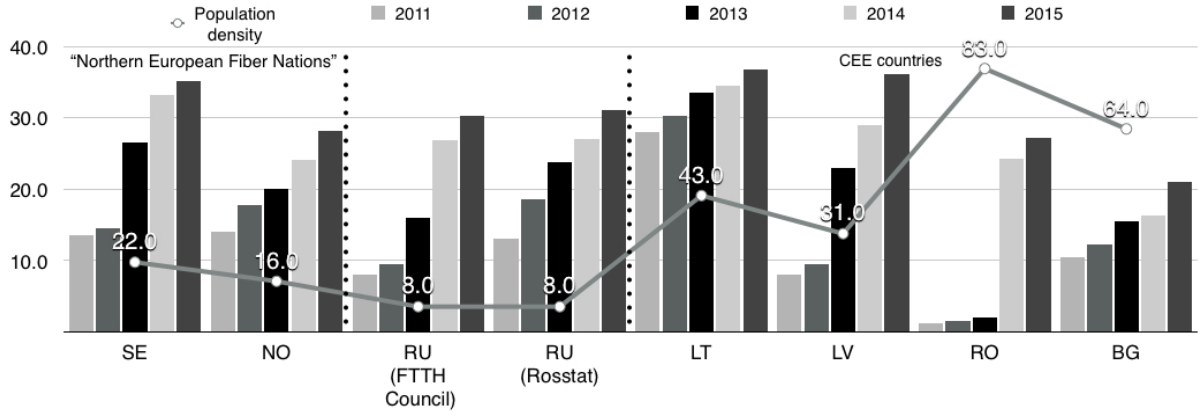

Fig. 1. FTTx penetration rate in the leading European countries (According to FTTH Council Europe and Rosstat).

The Russian figures in the chart are represented by two graphs. One of them is based on the data of FTTH Council Europe, and the second - on the data of Russian Federal State Statistics Service (Rosstat).[130] Despite the results are similar at the end of the analyzed period, the discrepancy of the previous years is noticeable. However, regardless of the chosen source, both pictures of the Russian industry explicitly show that the country has been among the European leaders of the FTTx networks at least since the beginning of the 2010s. The chart is also supplemented by information about population density in the analyzed countries (pop./km2), what demonstrates

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[128] For the purpose of the research, the term "penetration rate" has the same meaning as in the studies of FTTH Council. (*See* FTTH Council - Definition of Terms. Available at http://www.ftthcouncil.eu/documents/Publications/FCGA%20-%20Definition%20of%20Terms%20-%20Revisions2016.pdf).

[129] Among economies with at least 200 000 households.

[130] All data of Rosstat used in this research are available at www.gks.ru.

that economies of density has not played in favor of the Russian industry in this "cross-country competition".

4.2.3. Characteristics of the Russian institutional environment

As was noticed above, the process of formation of the modern landscape of telecommunications in different parts of the world had a different trajectory and pace, and has been expressed in diversity of dominated technologies in the markets of broadband access and different levels of the market concentration. Different territories not only had different starting conditions, but also different institutional environments, and this environment affected the conduct of market participants and, at the same time, had an impact on behavior of policymakers.

The role of an institutional environment in the growth and development of economy is widely recognized in new institutional economics. Acemoglu and Robinson (2012), for example, argue that economic prosperity of a country is determined by the inclusiveness of economic and political institutions, and point out that in non-democratic countries there is a proliferation of "extractive institutions" that enrich elites at the expense of society.

Acemoglu, Robinson and Verdier (2004) notice that in "kleptocratic" regimes "the state is controlled and run for the benefit of … [those] … who use their power to transfer a large fraction of society's resources to themselves". Some scholars argue that the emergence of the kleptocracy in Russia was among the distinct outcomes of Russian privatization (Black, Kraakman, and Tarassova 2000), and others, describing the modern Russian political system, use the term "kleptocratic authoritarianism" (e.g. Dawisha 2015).

The tremendous level of corruption in Russia has been noticed in numerous studies. One of the articles in The Economist (2012) claimed that "[f]or Russia's rulers, corruption is not a happy side-effect of power, but the core of the system". Russia's position in various studies dedicated to the corruption and democratic development has always been in the worst parts of the ranks. In 2013, according to the Corruption Perceptions Index of Transparency International, Russia shared the 127th place with such countries as Gambia, Lebanon, Mali, Nicaragua. Similar positions of the country can be found in the Worldwide Governance Indicators of the

World Bank,[131] and one of the Policy Notes of the World Bank (2013) pointed that the perceived impact of "state capture" in Russia increased between 2005 and 2011.

Elites in societies with the prevalence of extractive institutions "find it more beneficial to use their power to limit competition", and to form policies that protect their positions from the threat of creative destruction (Acemoglu and Robinson 2012). The Russian political system with rampant "extractive institutions" questions possibility to analyze the industrial policy in the country from the perspective of the idealistic or "public interest based" approach, while concepts of "private interest theories" such as interest groups, rent seeking or regulatory capture seem more appropriate tools for the analysis. Indeed, there are no robust reasons to assume that the creation of the high level of competition in the telecommunications markets has been among the real goals of Russian policymakers, and we will not find any proof of such a hypothesis in the regulatory practices if one risks to assume it. Moreover, it is much easier to suppose that the real purposes of the regulatory policy have been quite the opposite and that it incorporated business interests of major players and personal interests of policymakers, and, thus, it is even more interesting to understand how rivalry survived when regulation aimed to suppress it. This case also shows that there is a place for competition and for participation of small business in the telecommunications industry even without regulatory efforts for the creation of a competitive market, and it challenges many presuppositions about the "natural monopoly" nature of the industry, high costs of fiber-optic infrastructure deployment and necessity of concentration of resources for the development of the field.[132]

4.3. From the Soviet monopoly to the competitive market

4.3.1. The Soviet monopoly and privatization

The deregulation of telecommunications in the advanced parts of the world coincided with the period of formation of the market economy in the post-Soviet area. However, the process of privatization in Russia, including the privatization of

[131] Data available online at http://info.worldbank.org/governance/wgi/index.aspx

[132] Contemporary debate caused by the merger activity in the mobile industry shows different attitude towards the consolidation of the EU's telecommunications market and its impact on innovations and investment in the field. (e.g. Genakos, Valletti, and Verboven 2015).

telecommunications, and the process of liberalization of the industry in the developed parts of the world were different, and, thus, the creation of the modern telecommunications markets in Russia occurred in a different way. It is very important to notice that "state-led privatization" hardly can be attributed to a free market system, and the Austrian school has payed attention to such peculiarity of this phenomenon (Beaulier 2010). Meanwhile, there are sound reasons to argue that the market played a much more significant role in the privatization process of the telecom industry in Russia than in the advanced European economies. Of course, it is impossible to say that "all privatization efforts … occur[ed] outside the initiative and central direction of the state,"[133] and, moreover, it is clear that the power of the state has been widely used by private entities in their own personal interests, but, nevertheless, the weakness of the state allowed real market participants to take actions outside of the way that was envisaged by the state.

The planned Soviet system did not envisage private economic activity,[134] was entirely governed by the state and was based on the socialistic property on means of production.[135] The collapse of the USSR in 1991 was preceded by the period known as Perestroika that was initiated in the second part of the 1980s and allowed private entrepreneurship that, according to the goals of the reform, would contribute to the economic development of the country. The introduction of the institution of entrepreneurship required cardinal changes in the view on private property, and eventually in 1990 was expressed in the alteration of the Soviet Constitution and appearance of a statute that envisaged private property on means of production and introduced the term privatization.[136]

During the Soviet period, the communications industry was a single organization, that was governed directly by the specially dedicated Ministry through the regional departments. In the beginning of 1991 the Ministry of Communications, Informatics and Outer Space of the RSFSR[137] made a decision about the creation of

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[133] See the explanation of "spontaneous privatization" in Hill and Karner (1996).

[134] There were few exceptions such as handicrafting or private subsidiary farming (See Article 17 of the Constitution of the USSR of 1977).

[135] Article 10 of the Constitution of the USSR of 1977.

[136] Law of RSFSR of 24.12.1990 № 443-1.

[137] The process started even before the formal end of the Soviet Union where the Russian Soviet Federative Socialist Republic (RSFSR) was one of the republics.

state enterprises based on the regional networks.[138] It was a significant and doubtlessly positive distinction in the privatization process in Russia, that, perhaps, unintentionally created opportunities for the future formation of the competitive market in the industry. In other words, the regional telecommunications organizations, that in fact were just departments of the Ministry, were transformed into the regional state enterprises Rossvyazinform (RSI), that, despite of the state ownership, now had opportunities for some kinds of autonomous decision-making. More importantly, after this decision, the regional networks stopped to be parts of a single organization, and instead, despite the similar names, they had become separated from each other. However, they all had a single owner – the state –, and they still were under the monitoring of the Ministry.[139]

On 25 July 1992, the Russian Government enacted a Decree about privatization of the communications industry.[140] In this Decree, the Government noticed that the industry has a multi-industry nature and that this feature should be taken into account during the process of privatization. First of all, there were exceptions or particular rules for some sub-industries like postal services, special telecommunications services for government, research institutions and so on. Secondly, all television and radio broadcasting centers were a subject matter for integration under the control of a federal state company. The third and more interesting group of sub-industries for the present analysis is telephone networks, including local and intercity networks, packet switched data networks, etc.

The decision about privatization of the telecommunications industry supposed that regional RSIs could be privatized on a regional basis, and that after the privatization, the controlling interest of the new companies[141] should remain in the hands of the state. The next step according to these plans was the creation of a new company that would accumulate all state shares of these privatized companies and

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[138] The decision was expressed in a number of Orders of the Ministry concerning particular regions. E.g., Order of the Ministry of Communications, Informatics and Outer Space of 15.01.91 N 35 was dedicated to the creation of state enterprise Rossvyazinform of Novosibirsk Oblast. The similar document of the same date with number 31 was about creation of Rossvyazinform of Samara Oblast and so on.

[139] After the collapse of the Soviet Union, the Ministry has changed its name several times, and for some period it even lost the status of the Ministry. Currently the name is the Ministry of Telecom and Mass Communications of the Russian Federation. However, in general terms, regardless of the precise name at a particular period, for the purposes of this study it might be referred as the Ministry of Communications.

[140] Decree of the Government of the Russian Federation of 25.07.1992 N 526

[141] At that moment not less than 38%.

participate in the control and governance of the new industry. These plans materialized when Svyazinvest JSC was created in September 1995. This particular fact of the state participation in the industry performance through the ownership in the assets of the main players had a particular significance for the eventual monopolistic tendencies. It is even possible to argue that monopolization of the industry was programmed in the industry regulation even before the start of the privatization process, because, according to the program document, all regional privatized companies together with the unified operator of intercity and international phone services by the end of the reform had to be merged in a single monopolistic company. In December of the same year (1992), this Government Decree was substituted,[142] but the new regulation did not change the concept significantly, and the process had already been started.

Privatization in different regions occurred in different ways. It is outside of the scope of this research to look at the causes of these distinctions, but, it is necessary to highlight one general problem of privatization in Russia, namely, corruption, that played a crucial role in this process. Joseph Stiglitz (2003), for example, even claimed that due to this problem privatization in Russia should be considered as illegitimate. Jeffrey Sachs, economist from Columbia University and one of the advisers of the Russian government in the beginning of the 1990s said in the interview with the PBS about his experience of that time "...Russia experienced a level of corruption really rare in the world. ... [Russian] elite that had grown up in such an amoral, and I think one should say immoral, environment under the Soviet system.... Okay, now we're in a private property system, we'll steal it...".[143] The report about privatization in the period 1993-2003 of the Account Chamber of the Russian Federation[144] (2004) directly points out the tremendous number of abuses during the process, and even one of the main ideologists of the reform, "the founder of the Russian capitalism", Anatoly Chubais in one of his interviews acknowledged that the question of the reform was not a choice between "honest" and "dishonest" privatization, but between "bandit communism and bandit capitalism" (Ostrovsky 2004).

Corruption, accompanied by weak state institutions, allowed to privatize what could be privatized. Of course, not all had the same opportunities and not all were nimble enough. The other problem is that big parts of privatized property were under

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[142] Decree of the Government of the Russian Federation of 22.12.1992 N 1003

[143] See Interview with Jeffrey Sachs in Commanding Height (Jun. 15, 2000) Available at http://www.pbs.org/wgbh/commandingheights/shared/minitext/int_jeffreysachs.html

[144] This is the parliamentary body of the financial control in Russia.

control of the elite of the country,[145] but to find ways to efficiently use a position of a top-manager of new established RSIs for personal interests in the turbulent conditions was really possible. For some, it was possible to grab a part of "conditional" property of RSIs, because some assets were not documented in the proper way due to the mess in the Soviet economy.[146] For others it was possible to protect private affiliated companies through the formation of favorable contracts with incumbents about interconnection or the use of infrastructure of an RSI due to the weakness of central control from the new controlling authority.

Another possible way to benefit from the heritage of the former Soviet property in the industry was the usage of internal networks of industrial enterprises. During the Soviet period, many factories had their own telecommunications departments and managed to find ways to provide phone services to other departments and even to the personal needs of their employees. Huge factories, that produced aircraft, rocket engines, engineering equipment, etc., provided jobs to hundreds of thousands and had their own phone networks with connection to the Public Switched Telephone Network (PSTN). After the privatization in many instances the telecommunications departments of these organizations became separated companies that already had subscribers and interconnections with the successors of RSIs.

There is also a remarkable case of TransTeleCom (TTK), that benefited from the infrastructure of the Soviet railroads. The company, being the subsidiary of the Russian national railway operator (RZD), has had the ability to use the railroad infrastructure in order to develop the national fiber-optic networks connecting the major Russian cities, and eventually become a major player in the wholesale access market.

4.3.2. Development, competition and the trend towards concentration

By the time of the collapse of the Soviet Union, the entire communications sector was in a terrible condition. There were only two TV channels on the whole

[145] E.g., Guriev and Rachinsky (2005) point that some Russian oligarchs just "converted their de facto control [over Soviet state enterprises] into ownership rights".

[146] E.g. in Decision of 24.04.2009 on the case No. A55-17125/2008 of the Arbitration Court of Samara Oblast (VolgaTelecom v. The Federal Service for State Registration of Samara Oblast) we can find that VolgaTelecom OJSC, the successor of the former Soviet monopoly in Volga Federal Region, was very surprised when realized that the part of the regional telecommunications infrastructure had been registered as a property of another company by the Federal Service for State Registration.

territory (with minor exceptions). Public Switched Telephone Networks were mainly based on electromechanical systems. According to the data of Russian Federal State Statistics Service (Rosstat), in 1995 only 13% of all telephone exchanges in the urban area and 0,7% in rural area of the country were digital switches. Some regions did not have digital switches in the PSTN at all. Ordinary home telephone was a luxury article, and people were forced to wait for years in turn to become connected.

A decade and a half after the start of the reforms, the telecommunications industry in some Russian regions clearly evidenced benefits of the real competitive market. It was a common situation in many Russian cities when in 2007 several broadband services providers had their own FTTx infrastructure in the same buildings in addition to the incumbent's infrastructure.

Some indicators of the industry in Russia have shown better results than in the most developed parts of the world. The most remarkable is the deployment of networks based on the FTTB technology. According to the report of the National Research University Higher School of Economics, this technology dominated the whole Russian fixed broadband access market in 2014 with 65% of the subscribers of fixed broadband services,[147] while in the Western Europe the most widespread technologies were xDSL and DOCSIS (OECD 2015; Yoo 2014). Moreover, according to the presentation of Corbina-Telecom[148] about their results in 2006, approximately 57% of Moscow Internet users of that time already had access to the network through FTTB technology (Potresov 2006).

During the last decade, a stable trend towards concentration of the telecommunications market of Russia has been observed. This tendency has been expressed in the high level of activity in the field of mergers and acquisitions, that has significantly changed the landscape of not only federal, but also local markets. The analytical report of informational agency RosBusinessConsulting shows that in 2001 the mobile phone market was shared between six big players, many regional operators and regional successors of the former Soviet monopoly (RosBusinessConsulting 2002). By 2012 about 92% of the mobile market was already divided between four companies: the so-called, "Big Three" (VimpelCom, Megafon and MTS) and Tele2 (Advanced Communications & Media 2012). After the acquisition of Tele2 Russia by VTB Group and the creation of the joint venture with

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[147] This information is available on the website of the National Research University Higher School of Economics https://issek.hse.ru/news/161497531.html (in Russian).

[148] The company later was acquired by VimpelCom.

Rostelecom, currently about the entire mobile market of the country (with minor regional exceptions) is shared by these four operators.

The fixed market has also changed dramatically over the last 15 years. The initial plan of the privatization to unify the assets of the former monopoly materialized in 2011 when the regional assets of Svyazinvest were merged under the umbrella of Rostelecom (RTK). The significant contribution to the changes of the landscape of the industry has been made by the aggressive policy of acquisitions of small and regional businesses, as well as federal operators, by the main players of the field. In 2007 one of the Big Three mobile operators, VimpelCom, for $4,24 billion acquired Golden Telecom, which previously concentrated in its hands numerous regional assets, and became remarkable player on the fixed market.[149] Another company from Big Three and the biggest Russian mobile operator, MTS, was active in the fixed market from 1994 when the company managed to take control over the former Soviet telecom assets in Moscow through MGTS JSC. In 2010, MTS took control over Comstar-OTS, that provided the Internet and cable TV services for more than 4 million subscribers by that time, and over a number of local companies in various Russian regions.

For comparison, the analysis of the Moscow market of the broadband access in 2006 was presented by the following figures: 21% of households had broadband access to the network, 37% of them had been connected by MTU-Intel through ADSL,[150] 17% by the big three Moscow telecommunications companies of that time (Akado, Corbina-Telecom,[151] OPJS Central Telegraph[152]), 9% by other "big" companies (that had more than 10 000 subscribers each), 13% by "medium" providers (that had more than 2 000, but less than 10 000 subscribers each) and rest 24% by small operators (that had less than 2 000 subscribers each) (Gabitov 2006).

Nevertheless, it is very important to notice that despite of the consolidation of a significant part of the assets of the industry in the hands of few companies, the landscape of the market of fixed services and, especially, broadband services, unlike the mobile, of some of the Russian regions at the end of 2016 still could not be considered as oligopolistic. In addition to RTK, TTK, MTS and VimpelCom there is

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[149] Popular Russian Internet-portal CNews, dedicated to ICT area, pointed out that it was the costliest acquisition in the history of Russian telecommunications at that time (*CNews.ru,* Dec. 21, 2007. Available at http://www.cnews.ru/news/top/rekord_russkogo_telekoma_vympelkom).

[150] Nowadays, the business is a part of MTS.

[151] Nowadays, the business is a part of VimpelCom.

[152] Another successor of the Soviet monopoly. Nowadays, the company is owned by RTK.

another noticeable player, ER-Telecom, that was founded in 2003, and had rolled out the FTTB networks in 22 of the Russian cities. In 2014, the company had about 10 % share of the total Russian market of broadband access (J'son & Partners Consulting 2015). Presence and activity of these powerful players still leaves room for the local and regional businesses in the market of fixed telecommunications services. About 30% of the Russian market of broadband access in 2014 was shared by various local operators (J'son & Partners Consulting 2015). The next section provides more detailed picture of the telecommunications market in Russia with the analysis of its alteration over the competitive period of the industry.

4.4. Interplay between regulation and private interests in the Russian telecommunications industry

The chaotic privatization process that tore apart the industry on the regional basis and in many instances within the regions, provided the ground for the future competitive landscape. A number of privatized networks of former soviet industrial enterprises became independent players in this new market. They had their own infrastructure and did not have to rely on the access networks of the former soviet telecom monopoly. Newborn companies created through the use of positions of senior executives of the RSIs were even able to separate control over core parts of the local telephone networks, and that made such alternative operators independent not only on the issues of infrastructure, but even on the issues of interconnection. The core parts of the local networks in many instances by the end of the 1990s were shared by different companies, and a telecom enterprise seeking interconnection could interconnect its network to PSTN through the alternative operators of the backbone without the necessity to connect the network directly with the former monopoly.

Nevertheless, due to the prevalence of the private interests in the regulatory policy, the industry was unable to avoid dependence on the incumbents and the state. If to draw a timeline of the industry's evolution in the country, it would be reasonable to link the timeline with the main points of organizational development of the former monopoly. This process started with the separation on the regional basis of the original monopoly and the chaotic market activity of the regional business not heavily constrained by regulation, and ended in 2012 with the reincarnation of the former giant and the consolidation of the main industry's assets.

4.4.1. Post-privatization period of the 1990s

As was described in the previous section, the initial phase of this timeline was privatization of the regional assets of the former monopoly with preservation in the hands of the state the controlling stakes of the new enterprises. The initial privatization in Russia in the beginning of the 1990s took a form of voucher privatization, where active participation was taken by senior executives of the companies and regional business and criminal groups. Some researchers, who studied privatization of telecom in Russia, pointed out that for many privatized companies it was unclear who had become their real new owners and that in some cases it took several years before the first shareholders meetings took place (Bychkova 2002). During this period, not only did the state not have robust control over the industry development or the activity of independent enterprises that already appeared in the field, but it even did not have control over the former monopoly where it still remained the main shareholder.

This autonomy not only provided opportunity to increase the personal wealth through the use of the former soviet property, it also gave chances to make autonomous decisions about equipment procurements and creating partner relationships with foreign investors. According to some estimates, by 1996 the share of foreign participation in the local phone companies had reached 42% and a number of foreign equipment producers had entered the market (Bychkova 2002). Moreover, the pluralistic landscape of the telecom industry fostered pluralism of technological solutions and competitiveness of the newly formed telecom equipment marketplace. Many manufacturers were ready to supply their solutions with lucrative payment terms and considered the first steps in the Russian territory as strategic for their future market positions. As a result, just over few years of the openness of the industry, from 1990 to 1995, the number of households with access to PSTN had increased by about 28%,[153] despite the catastrophe in the country's economy,[154] hyperinflation[155] and unsteadiness of the new political system.

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[153] From 14.6 M in 1990 to 18.7 M in 1995 (According to Rosstat).

[154] GDP declined from $517.963 Billion in 1991 to $395.531 Billion in 1995 (According to WorldBank).

[155] Consumer Price Index in 1992 was 2608.8%, in 1993 - 939.9%, in 1994 - 315.1% (According to Rosstat).

The second phase of the timeline can be defined as an attempt of the state to take back control through the formation of organizational accountability of the regional incumbents and regulation. In 1995, the creation of state-owned Svyazinvest JSC, that accumulated the controlling shares of the privatized regional assets of the former monopoly,[156] was accompanied by the enactment of the Federal Law "About Communications."[157] One year later, in October 1996, the Government introduced the "Rules of interconnection."[158] However, these first attempts can hardly be considered as successful from the point of view of the regulatory functions. In many instances the appearance of Svyazinvest was merely unnoticeable by the management of the regional incumbents. The new powerful state holding initially consisted of just three employees and did not represent any serious threat to the autonomy of the regional business (Bychkova 2002). The same was the case of the new legal statutes - they contained many fuzzy norms and did not entirely reflect the new reality of the industry.

The absence of the control facilitated incorporation into the activity of the regional incumbents the personal interests of their managers and, again, played in favor of pluralization of the field. New entrants were able to get access to the incumbents' infrastructure or interconnection points, solving these issues in the local or regional level, and that fostered attraction of investment to the industry from different groups of investors, among whom the small and medium regional business had a noticeable role. If we look at the register of phone numbers distribution of the middle of the 2000s, which to a large extent reflects the historical picture formed in the 1990s,[159] we will find that in some cities such as Saint-Petersburg, Kazan, Samara, Ekaterinburg, etc. there were dozens of phone companies, and their number in Moscow exceeded one hundred. According to some estimates, at the end of the 1990s there were 92 incumbents in the local markets of phone services and about 2700 independent phone operators.[160]

One of the possible methods to get access to the resources of an incumbent was the creation of joint ventures, and this method was lucrative for mobile business

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[156] There were several exceptions when the regional companies retained their independence from Svyazinvest.

[157] Federal Law "About Communications" of 16.02.1995 N 15-FZ

[158] Decree of the Government of the Russian Federation of 19.10.1996 N 1254

[159] The earlier versions of the register is not available at the resources of the Ministry.

[160] See "Conception of development of the market of telecommunications services of the Russian Federation". The document is available via Internet Archive on the web-site of State Specialized Design Institute for Radio and TV (http://gspirtv.ru/149/).

start-ups. By the end of the 1990s, markets of mobile telephony of a number of Russian regions already had competitive landscape, and many of the mobile operators were independent from incumbents and from powerful national players. There were even cases where companies that later formed the Big Three of the market cooperated with local regional business in order to enter the region, and these ventures also had a significant degree of autonomy.[161]

The results of these "wild west" processes of the 1990s were expressed in the beginning of the 2000s in competitive markets of the fixed telephony of the most economically advanced Russian regions, and in four - five companies active in the mobile markets of these regions, where the national leaders competed with local rivals. However, this period can be also characterized as a period of the beginning of concentration of private interests in the industry and the increasing government role in the process.

In 1997, 25% plus one share of Svyazinvest was sold by the Russian government to Mustcom Ltd., the investment group where one of the key figures was George Soros' Quantum Fund. The developing new Russian oligarchy also actively participated in this process, as well as in the formation of the main industrial groups in the mobile and fixed market. It was also a period of entrance in the Russian market of foreign companies, that played both positive and negative role in the development of competition. Such companies as Telia, Sonera, Deutsche Telekom, Telenor have noticeable contributed by their participation in the mobile Russian business[162] into eventual oligopolization of the field. Others invested in the development of regional networks and, thereby, promoted pluralization of the landscape (e.g., Global One,[163] Combellga[164]). One of the most remarkable alternative players in the fixed industry became Golden Telecom, the company that as well as

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[161] E.g. Beeline-Samara OJSC was a joint venture of VimpelCom and regional business of Samara; Ekaterinburg Cellular Communications worked under the VimpelCom's trademark "Beeline" and after the independent entrance of VimpelCom in the market of the region decided to continue the autonomous activity under the new brand MOTIV.

[162] Telia and Sonera participated in the creation of Megafon (see http://www.teliacompanyhistory.com/sources/svenolof-karlssons-the-pioneers/the-pioneers-page-85/). Deutsche Telekom played an important role in the foundation of MTS (see http://www.company.mts.ru/comp/company/history/). Telenor in December 1998 formed strategic Alliance with VimpelCom and acquired a share in the Russian company (see https://www.vimpelcom.com/Media-center/Press-releases/1998/VimpelCom-and-Telenor-enter-into-strategic-alliance/).

[163] International consortium of Deutsche Telekom, France Telecom and Sprint.

[164] Joint venture with participation of Alcatel Bell and Belgacom.

the giant Svyazinvest was affiliated with George Soros through the group of other companies - Sovintel and Global TeleSystems (GTS).[165]

4.4.2. New industrial policy of the first part of the 2000s

The appearance of this concentrated interests led to alteration of the structure of Svyazinvest and its regional subsidiaries and to the formation of the new industrial policy. This may be considered as the next stage of the timeline. At the end of 2002, the regional assets of Svyazinvest merged into seven Interregional Communications Companies (ICC), and that was accompanied by the introduction of new regulatory frameworks. The analysis of this framework suggests that the main aim of the new regulation was the promotion of the interests of Svyazinvest and other major players of the industry controlled by the oligarchical capital. However, the low ability of the government agencies to enforce the legal rules and corrupted mechanisms of the system in its local and regional levels allowed independent market participants to survive in the market and to develop their business.

4.4.2.1. Interconnection

As was described earlier, the autonomy of the major regional telecommunications operators supplemented by the lack of the precise and clear rules allowed independent market participants to find ways to interconnect their networks with incumbents and even to use the incumbents' infrastructure due to the private interests of the executives of the established companies. The fuzziness of the regulation of interconnection of the 1990s to some extent gave power to make decisions about interconnection to local management of the successors of the former Soviet monopoly, and, thus, they had opportunities to find their own personal interests in this issue. Obviously, this situation was not in the interests of the main shareholders of Svyazinvest and, thus, required empowering controlling functions of the parent company. The reorganization of the regional companies into the seven ICCs aimed to address this problem. However, by that time, the independent market participants in many instances already were robust enough to compete with incumbents as peers. Moreover, their relationships with the subsidiaries of Svyazinvest was expressed in the existing contracts that not always put the

[165] About the affiliation of GTS and the Russian companies see, e.g., *Kommersant Newspaper*, Oct. 6, 1999, N. 182. Available online at https://www.kommersant.ru/doc/226874 (in Russian)

incumbents in a privileged position. There were situations when contracts envisaged equal payments from both sides of the agreement regardless of the size of their network. As a result, the beneficial solution for the giants could be provided by regulation that would establish specific requirements to the contracts and to the way of interaction between the operators.

The Federal Law "About Communications" was enacted by the Russian Parliament in 2003. It established the rights of telecommunications companies for interconnection with public telecommunications network (Art. 18).[166] The Law separated the telecommunications companies into two groups: "interconnecting companies", that provide interconnection services, and "interconnected companies", that receive these services. Formally, the Law obliged operators with significant positions[167] to provide such services under equal conditions to any company without the possibility to refuse and without discrimination. The new frameworks also introduced state regulation of prices for interconnection for such companies[168] and the rules of "interconnection and interaction of telecommunications networks".[169]

The crucial difference between the new and the preceding regulation of interconnection is that previously rules concerning interconnection were absent in the Federal Law, and the Decree contained many fuzzy norms that could be interpreted in various ways. The new frameworks clarified not only issues concerning the procedure of interconnection, but also established clear rules on how companies should make interpayments for the interconnection services, and how they must organize the transmission of telecom traffic and deploy their networks. The logic of the regulator imposed additional constraints on the alternative companies. The framework distinguished different kinds of operators of PSTN (local, fixed regional, mobile regional, intercity) and prohibited interconnection between some of them.[170] For example, direct interconnection between local and intercity telephone networks or between local and mobile networks were forbidden and operators were obliged to arrange these connections only through regional networks. At the same time, the requirements for the regional provider excluded from this activity independent

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[166] Art. 18. Federal Law "About Communications" of 07.07.2003 N 126-FZ.

[167] Despite the different terminology, this is an analogy of the European term "operators with significant market power" (SMP).

[168] Art. 20. Federal Law "About Communications" of 07.07.2003 N 126-FZ.

[169] Decree of the Government of the Russian Federation of 28.03.2005 N 161

[170] Order of the Ministry of Communications of Russia of 08.08.2005 N 97, and Order of the Ministry of Communications of Russia of 08.08.2005 N 98.

operators and allowed to be active on this market only major players. The regulation obliged to organize capacity for interconnection not only for companies with SMP, but for any company, and for some of them such requirements could be merely inconsistent with their survival purposes. For example, if a company provided phone services just between two cities of one region, according to the new rules, the operator had to organize interconnection points in "every administrative center and every municipal district" of the region, which made no commercial sense at all.[171] In the same way, within this regulatory framework, no one could provide intercity phone services just between Moscow and Saint Petersburg, because then they must also provide opportunities for other companies to connect to their networks in any region of the Russian Federation without any business reason for them to do so. The promotion of the interests of Svyazinvest was more than apparent: a significant part of regional and intercity voice traffic, as well as connections between mobile and fixed networks of alternative operators, now had to go mainly through the networks of its subsidiaries.

Another important aspect that was established by the new frameworks is the state regulation of incumbents' prices for interconnection in PSTN and the precise list of interconnection services. The prices for interconnection of alternative companies were also affected because they were deprived of the right to establish prices higher than those for the same services of incumbents in their contracts with the incumbents. This regulation was introduced by the Government in October 2005.[172] According to the Decree there are two main groups of interconnection services: formation and maintenance of the interconnection (interconnection services) and termination and origination of phone calls ("traffic transmit services"[173]). The "interconnected operator" was obliged to pay for interconnection services a one-time payment for the organization of an "interconnection point" and then for the maintenance of this "interconnection point". The previous practice was mainly based on this scheme, but in the new framework the operators, both "interconnecting" and "interconnected", were obliged to pay also for their traffic.

Meanwhile, it might be argued that the augmentation of the fixed payments by costs of minutes was mainly aiming to increase the payments of alternative companies

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[171] According to the rules, provision of the services between different cities of one region requires the status of regional network, and, thus, creation of "interconnection points in every administrative center and every municipal district of the region of the Russian Federation, where the network functions."

[172] Decree of the Government of the Russian Federation of 19.10.2005 N 627.

[173] This is the literal translation from Russian.

to the incumbents. The price for traffic heavily depends on the number of telephone exchanges that have been used in the termination (or origination) of a call,[174] and since the network of a company with SMP is, generally, much larger than the network of a small competitor, and since access to other networks was mainly also organized through networks of incumbents,[175] the average price of termination of incumbents is significantly higher than the average price of a small telecommunications enterprise.

The opportunities for local competitors to establish end-user prices higher than the prices of the incumbents have always been significantly reduced due to the presence of incumbents on the same market. At the same time, the cheapest termination rates of incumbents had been established by the state authorities on about the same level as the price for a minute to an end-user.[176] Such phenomenon in economic literature is usually referred as a price squeeze and very often is a subject to concerns of antitrust authorities (see, e.g., Dogan and Lemley 2008), but in this case the squeeze was an outcome of regulatory policy. The alternative operator had no opportunities to charge its subscribers more due to the competition, but, at the same time, was forced to pay often more for their calls than received from them. Even in the case of symmetric distribution of phone calls between the networks of an alternative operator and an incumbent, the economy of small business in this field was becoming quite problematic, because, depending on the network structure and the placement of the interconnection points in this structure, the skewness of the interpayments towards the big company could exceed the total incomes of the small one.[177]

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[174] The list of the "termination services" for local networks identifies such services as "termination on the communications node", "termination on the neighboring communications node", "termination on the network with one transit communications node", and "termination on the network with two or more transit communications nodes" (the translation is close to the Russian text, where communications node, basically, means telephone exchange).

[175] The list divided the aforementioned services on two groups: "termination on the network" and "termination on the network of another operator".

[176] E.g, according to Order of the Federal Tariff Service of 23.11.2007 N 294 in Saratov region the maximum rate for local phone services was established on the level 0,22 rub. per minute (including VAT). The cheapest price of VolgaTelecom, the subsidiary of OJSC Svyazinvest in the Volga Federal District, for interconnection services ("termination on the communications node") in the same region was established by Roskomnadzor (Order of the Federal Service of Supervision in the Sphere of Communications of 19.06.2006 N 51) on the level 0,2242 rub per minute (including VAT).

[177] The described above example of Saratov region shows, that interconnection prices could reach 0,59 rub per minute (including VAT) ("termination on the network of another operator with two or more transit communications nodes"), i.e. about 2.7 times higher than the rate for end-users. For the analysis of this economy see Trubnikov and Trubnikova (2010, pp. 157-187).

In those regions where the comparatively competitive market of telephone services was created by the time of this reform, the alternative operators had opportunities to alleviate the problems related to the new way of dealing with ICCs and some were even able to benefit from the new regulatory approach. The new issue that regulation raised before the alternative companies was the rates for termination that could threaten their business. The highest price was "termination on the network of another operator" and these rates in some places were more than two times higher than the prices for end-users. However, this problem had a solution - the formation of peer-to-peer interconnections between the alternative operators that allowed to avoid incumbents' transit in the termination.

The other problem is the different rates that depend on the number of telephone exchanges in the phone network of a telecommunications company, but this problem also could be solved via the alteration of the structure of a network of an alternative operator and through the networks of other peers.

The requirements for regional phone service providers to have interconnection points in every administrative district could be solved through the fake rent of communication channels. This solution was based on the simple reasoning that nobody will ever use these channels due to the total lack of demand and that these requirements are just a red tape that should be circumvented. Some alternative operators were able to help each other to sign such contracts because everything what they really needed is just to show these contracts to Roskomnadzor, and after that the contracts that never worked in the reality could be cancelled. The crucial point is that the rule obliged operators to have these "interconnection points", but not to actually use them. However, it is necessary to mention that in the regions with few alternative companies, such a solution was difficult. The significant part of this inner-regional phone connection is termination of the phone calls between local networks and mobile networks, and this slice of the pie was very big for mobile companies to give it to incumbents of the fixed market. As a result, mobile companies entered this market. Additionally, showing that they have "interconnection points" in every district was not a problem for mobile operators, since it was precisely the main part of their mobile business.

4.4.2.2. Distribution of radio spectrum

Possibly, the most remarkable scandal in the industry in the middle of the 2000s was the suspicion that one of the Big Three mobile operators, Megafon, had

connection with business interests of L. Reiman, the Minister of Communications at that time. This suggestion was a plausible explanation of the fact that Megafon was able to become the first company to get GSM frequencies throughout the Russia in the beginning of the 2000s. The situation has become a topic of legal investigations outside of Russia, and was highlighted in international mass media (see, e.g., White, Crawford, and Simpson 2006; Khilji 2014). Some of the investigations went deeper in time and shed additional light on peculiarities of Russian privatization (Khilji 2014).

The aforementioned story was, possibly, the most remarkable example that characterizes the situation with distribution of the radio spectrum, but it was by far not the only case of incorporation of private interests in the regulatory mechanisms. Eldar Razroev, a former advisor of the Minister of Communications and a former top-manager of all the Big Three companies at different times, in an interview with Forbes said that he "know[s] no one "clear" deal with radio frequencies, when people, who make decisions, did not have some interests" (Filonov 2014). The competition for regulatory goods on the mobile market was not less important than the competition for subscribers. Those who lost the battle for regulation, eventually, were forced to leave the market of mobile services (see, e.g., Filonov 2014).

The most noticeable feature of the entire process of radio spectrum distribution was the lack of transparency and accountability of regulatory agencies in all of the steps of the process, that could take years without provision of any certainty about the future results. The Big Three companies affiliated with the Russian oligarchy could solve the necessary issues related to the frequencies allocation for the development of their networks. At the same time, for many small regional mobile service providers these opportunities almost ended in the 1990s. As a result, Big Three jointly with the Russian version of Tele2, that currently a 100% subsidiary of the reincarnated former Soviet monopoly and state-controlled VTB Group, were able to take control over the entire Russian mobile market with minor regional exceptions.

The regulatory frameworks related to the spectrum distribution due to their ambiguity, the complexity of bureaucratic procedures, and lack of transparency and accountability of the authorities provided clear opportunities for those who had the ability to use regulation for their own personal interests to control entry into the market, as well as, to capture control over the implementation of innovations in the industry, and this is the main explanation of the clear oligopolistic landscape of the field, but not the peculiar characteristics of the industry.

The exit of regional mobile operators from the market implicitly affected the business of local companies. The development of regional business often formed close relationships and cooperation between the market actors: interconnection, sharing of the infrastructure and technical facilities, mutual aid during the processes of "commissioning of communication facilities", etc., and an acquisition of a regional company by one of the giants merely signified a break of all such business connections.

4.4.2.3. Commissioning of communication facilities

Another important document that had become a part of the new regulatory framework was Order 113 of 09.09.2002 of the Ministry of Communications "The rules of commissioning of communication facilities".[178] This document for many years was the bible for the employees of telecommunications companies who were responsible for the roll out and development of networks of their companies. The rules determined the procedure of commissioning of networks and all communication facilities that could be used in telecommunications services. According to them, prior to exploitation of any telecommunications facility or any new part of telecommunications networks, telecommunications operators had to obtain an "Operating permit" for this facility from the federal executive authority in the telecommunications industry[179] (Roskomnadzor[180]).[181]

This procedure consisted of several steps, and the first two of them required (1) to design a project related to the new facility and (2) to make examination of this project by a special state organization. The project must comply with numerous requirements and documents, and must be prepared by a special enterprise that had an appropriate license for this type of work, and an applicant must receive a positive conclusion about validity of the project. It is important to notice that one of the most remarkable players in the market of such project design was OJSC Giprosvyaz, a subsidiary of Svyazinvest at that time, and that increased dependence of the

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[178] Order of the Ministry of Communications of the RF of 09.09.2002 N 113. The document was substituted by the new rules only on 01.01.2015 (Order of the Ministry of Communications of the RF of 26.08.2014 N 258).

[179] Currently, this federal agency is the Federal Service for Supervision in the Sphere of Communications, Information Technologies, and Mass Media, but during the analyzed period the agency changed its name several times.

[180] Roskomnadzor is the current official acronym of the name of the agency.

[181] p. 3.9 and p. 3.10. of Order of the Ministry of Communications of the RF of 09.09.2002 N 113.

alternative players on the incumbents, especially when their projects related to interconnection with them.

It should be noticed that compliance with these rules was extremely time consuming and so expensive that in some cases, and especially in the business of small telecommunications enterprises, it could be compared with the costs of the deployment of the facility. On the one hand, of course, it was in favor of big business due to the economy of scale of such compliance, but on the other hand, it could undermine not only business of small companies, but heavily affect the development of the entire telecommunications industry, and it seems, that such situation was not among the purposes of the policymakers. As a result, the document contained a list of telecommunications objects for which the procedure was not necessary.[182]

Among others, the design of the project and its examination were not mandatory for providers of telecommunications services with the implementation of such technologies as MMDS, L-MDS, MWS, MVDS; networks for cable radio; fiber-optic lines for the purposes of cable TV services, centers of telematic services. However, what is most interesting and what explicitly questions the presence of public interests in such regulatory frameworks is that the policymakers excluded from the necessity of the compliance with this rule the significant part of the business of mobile companies. The list contained such vital operations for development of mobile networks as constructing of any communication lines for the connection of BTS or any other parts of mobile networks regardless of technology (fiber-optic or radio relay links), commissioning of BTS, BSC or repeaters. Even extensions of capacity of switching subsystems of mobile networks did not require the design and the state examination of such projects.

Indeed, if the goal of the requirements is "organizational and technical support of sustainable and secure operation of communication networks",[183] then why did mobile networks have immunity from the significant part of the policy? Why did fiber-optic lines for the purposes of mobile services or cable TV not endanger the integrity of networks and services, while a provider of telephone services or broadband access had to collect a number of documents in order to design a project for the same cable solution, wait months or even years for the state expertise and pay for all of these completely unnecessary for his business actions?

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[182] Appendix A of Order of the Ministry of Communications of the RF of 09.09.2002 N 113.

[183] One of the stated purpose of Order 113 of the Ministry of Communications.

Addressing this issue from the perspective of regulatory capture provides plausible answers to these questions. The entry control in the mobile market can be easily carried out through regulation of radio frequencies distribution. In this sense, it is completely obsolete to force the major beneficiaries of the regulation to carry additional compliance burdens, and the eventual creation of the oligopoly in this market supports this conclusion. The cable TV industry at the time of the enactment of this regulation was only in the stage of formation, required substantial investments and had been supplementary to other telecommunications services, that were a subject matter of these regulatory efforts. At the same time, the market of fixed phone services was a major business in the fixed part of telecommunications, and implementation of fiber-optic lines in the broadband access was considered as a logical course of its development. Therefore, this regulatory approach allowed to control the entry of new players and development of their networks and services. Moreover, it also helped to force alternative operators to comply with the rules of interconnection that, as we saw before, had been developed in the interests of incumbents.

Nevertheless, despite the limitation of Appendix A of Order 113 of 09.09.2002 of the Ministry of Communications, this part of the document had always been a heaven-sent legal opportunity for alternative companies in the development of their networks. Those who wanted to be successful in this unequal battle with the government interventions in the market had to define their operations in such a way that they would fall within the exceptions from the list. They turned out to be very creative in doing so.

A common practice for broadband access providers in this respect was to claim that their entire network is a set of "nodes of telematic services" and kilometers of fiber-optic cables are the integral part of these nodes.[184] Another opportunity to use fiber-optic lines was to use cables, that previously had been shown in the documentations for other purposes, such as cable TV services or mobile services, because after their commissioning, the "Operating permit" for these facilities already existed. The presence of regional companies at the markets of mobile telephony and cable TV and their freedom in the decision making allowed such assistance and cooperation.

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[184] According to Appendix A of the Order, communications facilities for telematic services were an exception to the requirements.

It is necessary to note that many alternative providers considered themselves as allies in their dealing with Roskomnadzor. Moreover, in many instances it was very useful to help each other even with temporary contracts in order to supplement the required set of documents. There have been several online portals were technical specialists of telecommunications industry, mainly from alternative companies, shared their experience about communication with Roskomnadzor and provided useful and detailed advices about the conduct during the commissioning of communication facilities.[185]

Another important aspect that allowed the development of alternative operators despite the regulatory efforts to limit their activity is the low level of acquaintance with new technology of state authorities. The telecommunications technologies primarily developed outside the borders of the Soviet Union. The most widespread telephone exchange systems in the public switched telephone network of Russia by the beginning of the 1990s were electromechanical.[186] There were common usage of step-by-step switchers and some even were manual telephone switchboards. The graduates of telecommunications universities at the end of the 1990s still were trained with such systems in laboratories and after graduation obtained their knowledge of new technologies in the real practice of telecommunications companies. At the same time, many employees of Roskomnadzor were older people with no opportunity to receive such practice. This gap between knowledge of employees of the telecommunications market and those who had to defend the interests of powerful players, enforcing the "captured" rules, led to the enforcement failings of regulation and facilitated the development of the industry.

4.4.3. The broadband revolution of the second part of the 2000s

The attempts to restore control over the industry and empowering of the most influential players of the field by the middle of the 2000s has started to bear its fruits. By that time, the ICCs finalized their organization and moved the entire managerial functions from the regions to the macro-regional centers. The entire mobile market of the country was on its way towards the national arena for just several players, the powerful Moscow companies with participation of foreign capital such as Golden Telecom or Comstar-OTS were acquiring regional telecom businesses throughout the

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[185] Maybe, the most popular were forum.nag.ru and electrosvyaz.com/forum/

[186] According to Rosstat.

country. The formation of interconnection rules and rules concerning the structure of the networks forced many players to quit the marketplace through the selling of their enterprises. Nevertheless, the processes of the second part of the 2000s showed that the pluralistic landscape of the industry, that still remained by that period, provided fertile soil for the creative destruction process, and that opened opportunities for new ventures that brought innovations in the field, and the regulation was not ready to stop its development in order to protect the positions of the leaders.

The start of the Internet expansion in Russian regions happened later than in the advanced economies. In the beginning of the 2000s, just a tiny part of households had personal computers, and the demand for Internet access was mainly formed by commercial organizations. Because the industry in many of the regions was represented by a number of telecommunications companies that possessed their own infrastructure and was independent in its development from the former monopoly, it gave birth to appearance of independent Internet Service Providers (ISP) that did not have to rely on the kindness of the official incumbents' policy in order to get access to the local loops — they could obtain this access either to the wires of independent players, or even to the wires of incumbents through their personal relationships with local management of the former monopoly. However, by the middle of the 2000s the later opportunity has disappeared.

The Russian regulation has never tried at all to solve the problem of local loop unbundling and to force operators to share their facilities. This unbundling was to a large extent a natural outcome of market forces. Many local phone companies in the beginning of the 2000s did not consider Internet business as a field for their development. For them the appearance on their local loops of external ISPs was merely an opportunity for additional revenues for their phone undertakings. Possibly, the most prominent example is the cooperation between MGTS and MTU-Intel, that allowed the latter to become a leader in the broadband market of Moscow by 2006 (Gabitov, 2006).[187] This situation played in favor of formation of a market of Internet access separated from the phone business, and a competitive landscape of this field has been formed.[188]

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[187] See the history of MGTS on http://mgts.ru/company/foundation/ where the collaboration with MTU-Intel is advertised in 2004.

[188] One more time I have to underline that situation was different in different territories, and competitive Internet access markets were mainly formed in those regions where competitive phone markets were an outcome of the "wild" 1990s.

Strengthening of regulation, consolidation of the phone assets, elimination of the autonomy of the major regional players and increasing activity on the Internet market mainly through promotion of ADSL technology of the federal companies raised crucial issues for local ISPs about their future positions in the market. The most apparent solution was the use of alternative technologies of Internet access that would be better suitable for the growing demand. The solution had been found in technologies of wireless broadband access and FTTx, and the two following subsections are dedicated to the analysis of development of these two alternatives for copper networks, that eventually expressed in the one of the highest in the European continent level of development of fiber-optic infrastructure.

4.4.3.1. Wireless broadband access

In general, the start of the development of wireless access networks in Russia was mainly warranted by the insufficient copper infrastructure in low-density areas, that in many instances made wireless access the only possible solution for the service provision. Such exclusivity allowed to charge higher prices than the prices of wired services, what at the same time was backed by the higher costs of the services provision, and, as a result, the service was a very niche category that was interesting neither for incumbents, nor for the major federal players.

The companies that developed such networks used a number of incompatible technologies that worked in different radio bands. Since these markets were not interesting for major players, and since they also did not consider these radio bands for their future developments, obtaining such radio frequencies proved feasible for alternative undertakings. There was a number of such networks in different regions of the Russian Federation that were mainly independent from each other and could be represented by small often almost invisible dots on the map of the country, and none of them had real ambitions to cover the noticeable territory of the country and enter interregional or federal markets.

In 2005, the situation changed dramatically. The appearance of WiMax had allowed to look at the broadband wireless market not only as a possible alternative for traditional fixed services, but also as at the field that would change the nature of the entire wireless industry (See the next Chapter. See also Trubnikov 2017a). A number of Russian entrepreneurs embraced the vision of the future of telecommunications industry promoted at that time by Intel Corporation, and launched projects of WiMax networks with plans to become the federal providers

with a coverage area of the scope of the country. The first network was rolled out in December 2005 in Samara by MetroMax Group.[189]

By 2008, fixed WiMax networks had been deployed in a number of Russian regions by Enforta and MetroMax. There was also the entrance to the wireless business of Virgin Group that had a goal to capture 10% of all broadband access market of the country within 5 years (CNews.ru, May 15, 2008). Several other alternative companies announced their plans to invest in WiMax development and to enter the battle for the wireless market of Russia, and many of them began the realization of their intentions (Summa-Telecom, FreshTel, Synterra, Corbina Telecom, Mediaseti, ACBT and so on).

The major problem of these fixed WiMax solutions was that the radio band — 3.5 GHz — did not envisage mobility, while many of the actors considered the implemented fixed version of the technology as an initial step for their future wireless paradise. Meanwhile, the appearance of competitive mobile wireless broadband market was not in the interests of the major players of the field, and as a result none of those who had already experienced with fixed WiMax networks was able to obtain the frequencies that could allow mobility. At the same time, in 2008, the company Scartel LLC (the owner of the brand Yota) launched its WiMax network in 2.5 - 2.7 GHz radio band in Moscow. The company, that was founded only one year before and did not participate earlier in the telecommunications market, was able to obtain the monopoly on the whole commercially interesting territory of the country on this part of the radio spectrum.

This fantastic success of the newcomer raised curiosity of some Russian mass media. According to Forbes, the radio frequencies could be bought for $70 million (Dzyadko 2011), but since there were no legal mechanisms to sell radio frequencies, such claim, if it reflects the truth, reveals illegal methods of the radio spectrum allocation. There is also possible another explanation of this “miracle”: according to the official press-release of Scartel, from the moment of the foundation of the company the state-owned corporation Rostec[190] had had an option on the acquisition of 25,1% of the shares of WiMAX Holding Ltd., the owner of Scartel at that moment,

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[189] See Press release, Airspan Networks Inc., Airspan Delivers First Commercial WiMAX Network to be Built in Russia, (Jan. 3, 2006) Available at http://www.airspan.com/2006/01/03/airspan-delivers-first-commercial-wimax-network-to-be-built-in-russia/

[190] the gigantic “state corporation” that controls the defense-industry complex and numerous other industries of Russia (http://rostec.ru/en/about).

and Rostec exercised the option on 30 October 2008.[191] In 2011, with a direct participation of Vladimir Putin, the company agreed to provide its networks for Big Three (Tsukanov 2011), and the next year Yota already merged with Megafon. In 2012, all companies from Big Three and successor of the Soviet monopoly Rostelecom joined Yota-Megafon in the mobile wireless broadband market.[192]

This example shows that regulation can be used in the interests of those who have access to the regulatory body, and that it does not matter whether these interests have been achieved through bribery, positions in the Government or partnership with state-controlled corporations. What matters is that the public discussion about such decisions never existed and that the most valuable radio resources, in fact, were not available for independent market participants.

However, the peculiar feature of the Russian socio-economic system is that corruption not only allows establishing the rules to the benefits of the elite, but also provides mechanisms to circumvent these rules through bribes, "creative compliance", using incompetence and inability to enforce the law by regulators or to find loopholes in the incomplete legislative system. The regulation of the radio spectrum represents an example where all these ways have been used in the practice of telecommunications companies in the country.

The response of the market to the inefficiency of the regulatory policy has resulted in the significant part of fixed wireless broadband access networks that functioned without a complete set of necessary documentations or any legal documents at all. What is, maybe, even more interesting is that the problem of interference, that is usually claimed as a main reason for regulation of radio spectrum, could in practice be solved by market actors through negotiations. An explanation of this phenomenon is very simple: when companies use radio frequencies illegally, they have enormous incentives to find solution to interference issues through their cooperation.

According to the report of Roskomnadzor in the first 9 months of 2014, this organization was able to identify 17 842 cases when radio equipment operated

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[191] Press release, Yota, Rostehnologii voshli v proekt Yota [Rostec Entered the Yota Project] (Nov. 11, 2008) (Russ.) Available via Internet Archive at https://web.archive.org/web/20110319024614/http://www.yota.ru/ru/info/news/details/?ID=700

[192] It is interesting to note that the initial plans of Yota were based on the implementation of Mobile WiMax technology (and the first networks of the company were Mobile WiMax networks), but the company, despite the absence of the principle of "technological neutrality" in the industrial policy, was able to change the technology to LTE, when it became clear that WiMax lost the battle to LTE.

without assigned frequencies.[193] That means that more than 97 violations were identified every working day. Unfortunately, there is no ways to determine the total number of such illegal operations of radio equipment, but it is safe to assume that the real figure is significantly higher than those that have been caught by Roskomnadzor.

Even for big corporations it always has been a common practice to use radio equipment without the complete set of legal documents and without allocated frequencies. Simply searching for the names of the Big Three mobile operators in the news of regional branches of Roskomnadzor shows us examples of such situations.[194] In the presence of real demand for the services, the temptation to violate these norms is obvious. Moreover, the fees for the violation are quite insignificant for the scale of the business of such companies. According to the Russian Code of Administrative Violations, the fine for the exploitation of radio equipment without appropriate documents is from 10 000 Rubbles to 20 000 Rubbles (about $260 - $520 according to the average exchange rate of 2014) for legal entities.[195] However, for an independent enterprise in addition to the fine there is also a chance to face a criminal accusation of illegal entrepreneurship.[196]

Regulation of the usage of radio frequencies in Russia until recently had never included the principle of "technological neutrality", and that means that in order to implement a new technology in a wireless network, a company had to overcome from the very beginning all of the sophisticated and nontransparent bureaucratic procedures, including the mandatory coordination with the military agency.

For big companies the opportunities to circumvent these requirements have been limited due to the fact that their activity is always in full view. At the same time, for small enterprises the pathways around these norms were feasible. Many small telecommunications companies were able to implement different wireless technologies in their networks without the proper documents, and it was possible because Roskomnadzor had no capacity to enforce the law everywhere, mainly due to the lack of specific knowledge of the employees, resources and special instrumentation. The density of population in Russia is relatively small, and necessity to monitor the usage of radio spectrum on the entire territory in the absence of interference is quite doubtful.

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[193] The report is available on the official web-site of Roskomnadzor http://rkn.gov.ru/communication/p646/

[194] E.g. news of Roskomnadzor of 10.02.2016 http://rkn.gov.ru/news/regions/news38134.htm

[195] See Art. 13.3 of Code of Administrative Violations of the Russian Federation of 30.12.2001 195-FZ.

[196] See, e.g., news of Roskomnadzor at http://59.rkn.gov.ru/news/news4292.htm

The WiMax movement in Russia had a positive impact on the development of entire broadband networks in the country. The private investment in the broadband solutions contributed to the backbone development, that, in turn, became essential elements of the growing FTTx solutions. Moreover, it gave the industry understanding how to solve existing problems of infrastructure shortage. The possibilities to pass around the law in the wireless networks development formed new skills of the alternative entrepreneurs, and that was expressed in the rapid development of local broadband networks that used various kinds of cheap wireless equipment that allowed to provide access to remote territories, and that even was used to connect separated parts of FTTB networks.

4.4.3.2. FTTB

The second part of the first decade in the 2000s in the Russian telecommunications was characterized by the exponential growth of broadband networks that were based on the fiber optic to the buildings approach (FTTB). The frontrunners of the development of FTTB networks in Russia were not the established federal companies. On the contrary, their networks represented the classical examples where the "replacement effect" stifled the development of the more advanced technology. At the same time, the alternative ISPs, that did not have their own copper infrastructure and that understood that for their future business positions they have to enter the infrastructure market, were the main players in the beginning of the process who moved the fiber closer to the subscribers.

Moreover, the FTTB solutions have changed the economy of telecommunications dramatically. The prevailing view that the industry's development requires high level of investment that usually refers as high level of sunk (fixed) costs had become irrelevant to the area. The FTTB networks demonstrated the totally opposite paradigm: the cable and the work with the cable is comparatively cheap,[197] the growing market of computer networking equipment supplied to the alternative players switches and routers that provided inexpensive solutions for the

[197] However, this note is not applicable to the construction of the ducts or to the placement of the cable in the ground.

access networks,[198] and the formed market of "used Cisco"[199] allowed to find affordable equipment for the core parts of the networks.

As a result, the absence of regulation of bottlenecks was not a problem for the alternative companies, because they did not need this access at all. They could develop their own infrastructure, but the problem was where to place this infrastructure. If the FTTB networks were not expensive endeavors, the technology was not able to change the high costs of construction of underground ducts. Since the significant parts of the existed underground ducts were controlled by the former monopoly, aerial wiring appeared as an obvious solution for the networks' roll out.

Therefore, many companies that wanted to develop their own cable infrastructure understood that they had to find ways to make contracts either with a company that is in charge for public lighting, tram-trolleybus authorities or with those who maintained buildings. An interesting fact is that there were some legal restriction to hang the communications cables that contained conducting elements on the lampposts, while for dielectric types of fiber-optic cable such restrictions did not exist. This aspect spurred the development of fiber-optic networks in the big cities, that had by the middle of 2000s a competitive telecommunications market, and encouraged the implementation of FTTx technologies. The remarkable picture of the Moscow market, highlighted in Section 3, shows that 24% of the market share in 2006 was under the control of companies that had less than 2000 subscribers each. Taking into account that the broadband penetration estimated at the level of 21% of households (Gabitov 2006), it is possible to infer that there were hundreds of the small ISPs in the broadband market of Moscow at that period. Moreover, despite the fact that the major players of the market used ADSL technology (Gabitov 2006; Potresov 2006), the share of subscribers connected through FTTB networks in Moscow already achieved at that time 57% (Potresov 2006).

The interesting competitive landscapes had been also formed in the regional markets where incumbents and powerful federal companies faced severe competition from the independent movement. For example, in Chelyabinsk, that has population of about 1.13 million inhabitants, in 2008, 58.6% of the broadband subscribers had the access through FTTB solutions (Kusch 2008). The leader of the market with about 40% of the market share was local company Intersvyaz. The incumbent, one of the

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[198] Some examples of prices of the computer networking equipment, as well as of fiber optic cables in the Russian market might be found at https://shop.nag.ru/catalog

[199] See, e.g., http://www.usedcisco.ru

ICCs of Svyazinvest, Uralsvyazinform was on the second position with about 33.9%. The market share of the only federal player ER-Telecom was less than 10%, and the rest was shared by many small and medium enterprises, whose total number exceeded two hundred. There were also remarkable examples in Ekaterinburg, Kazan, Novosibirsk, Omsk, Samara, etc.

Even in those cities, where rivalry in the market had not been formed by 2006, new entrants still were able to use the same "aerial wiring" business model. ER-Telecom, that started its federal expansion from Perm Oblast in 2005-2006 and has become one of the country leaders in the fixed broadband access market and in the market of cable TV, mainly used this approach in the development of their networks. By 2015, the company had been able to become one of the most noticeable players in the federal broadband market entering the markets of 22 Russian regions, and it did not depend on the infrastructure of the major players in this process.

The appearance of ER-Telecom, as well as the activity of a great number of independent ISPs that rolled out their own FTTB infrastructure forced the established players to change their methods of service provision and substitute ADSL access networks by FTTB solutions. The example of ER-Telecom encouraged MTS to follow the same approach and construct their own FTTB networks, developing the acquired venture of Comstar-OTS. For example, in Rostov-on-Don, the company constructed the FTTB network in the same districts of the city where other companies such as the incumbent RTK and the noticeable player SPARK,[200] as well as several small local operators, already were doing their business. Similar pictures were observed in Volgograd, Saratov, Ulyanovsk, Krasnodar, Samara and many other regions of the country. Moreover, this picture is not only the feature of the big cities. It is possible to meet a number of small enterprises that were active in small towns with the presence in the market of several powerful companies and that even managed to attract investments in the development of their FTTB infrastructure. The results of this activity have been expressed in the existence of parallel infrastructures, when several telecom enterprises were presented at the same time in the same buildings and competed by their own wires.

[200] the TM of CJSC "Electro-Com", that was acquired by TTK in 2012.

4.4.4. Reincarnation of the Soviet monopoly

The prevalence of private interests in regulation of economic activity in the Russian Federation has moved all the industries of the country towards concentration. About all spheres of economic life have been becoming more and more concentrated, and the control over regional economic resources have been transforming to the hands of powerful business groups from Moscow. Even Russian officials have admitted that the "high level of monopolization" is a "scourge" of the Russian economy.[201] It has expressed in the tremendous level of inequality in the country, the current economic situation and the capital outflow that dramatically increased after 2007.[202] According to Credit Suisse Research, in 2014, Russia had one of the highest levels of inequality among the analyzed countries, and this figure had significantly increased over the preceding seven years.[203]

Telecommunications have not been an exception from this general pattern of concentration. As it was noticed in Section 3, the eventual monopolization of the industry was programmed in the beginning of the reform, and the next step of the development of Svyazinvest was a merger of all of its separated assets into a single organization. In 2011, all Interregional Communications Companies had been connected to Rostelecom, another subsidiary of Svyazinvest, that during the privatization process was separated into a state-owned operator of intercity and international telephony. In 2012, Svyazinvest merged with its subsidiary Rostelecom, forming the single organizational structure that had integrated the telecommunications assets of the country where the state had had the controlling interest after the privatization of the 1990s. Since that moment the new questions about privatization of the state shares of Rostelecom have been raised a number of times, but there are no reasons to assume that this new stage of privatization might be in any sense a pro-market or pro-competitive endeavor.

The concentration of the field has also expressed in the slowdown of the industry development. According to the official data of Russian statistics, the

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[201] The speech of D. Tulin, the first vice-chairman of the Central Bank of the RF. See Gazeta.Ru, Jan. 19, 2016 (Available at http://www.gazeta.ru/business/news/2016/01/19/n_8138117.shtml)

[202] The information is available on the official web-site of the Central Bank of Russia at www.cbr.ru/statistics/credit_statistics/bop/outflow.xlsx

[203] See Credit Suisse (2014). The report claims that "[t]he majority of countries, including many big players on the international scene – Brazil, India, Indonesia, Russia, South Africa and Turkey – qualify as "very high inequality." According to our estimates, inequality in Russia is so far above the others that it deserves to be placed in a separate category."

exponential growth of broadband subscribers has turned to just 15% over the period 2013 - 2016, where in 2016 the growth was only 2.6%. Moreover, over this three-years period some of the regions showed decline in the number of the fixed broadband subscribers (Moscow, Volgograd Oblast, Udmurt Republic, Orenburg Oblast, Krasnoyarsk Krai, Omsk Oblast, Kamchatka Krai and Chukotka Autonomous Okrug), and the growth in many others did not exceed 5% (Kaliningrad Oblast, Leningrad Oblast, Murmansk Oblast, Novgorod Oblast, Republic of Ingushetia, Republic of Tatarstan, Samara Oblast). Of course, in some of these cases, such as Moscow, Samara or Kazan, it would be possible to suppose that the industry due to the previous competitive form has been already able to achieve the penetration level that close to the actual demand, but such explanation cannot be applicable to all territories.

Nevertheless, the competitive period has allowed the industry to be among the European leaders of the telecommunications development. Even after the consolidation of the main assets, broadband markets of many of the Russian regions have been able to preserve a competitive landscape. The growth of FTTx penetration, that is still observed in the country (FTTH Council Europe 2016), is to a large extent the result of rivalry in this sphere, that, despite the economic stagnation, forces the market participants to increase the quality of the services with preservation of the affordability of the prices.[204] There is still competition between fixed networks and mobile networks that also affects the rates and to some extent explains the decline of the number of the fixed broadband subscribers in some of the territories.

One of the most distinctive outcomes of the competitive history of Russian telecommunications is that the successor of the Soviet monopoly has not been able to obtain the unconditional dominance in the broadband access markets. Rostelecom possesses the greatest part of the underground cable infrastructure throughout the country (with minor exceptions), including territories where competitive markets have not been formed. The company receives subsidization from the Universal Fund, that redistribute 1.2% of all revenues from telecommunications services into the

[204] The cheapest offers of ER-Telecom in 2017 already start with the speed 40 Mbps and with the price around 400 Rub. (less than 6,5 Euro according to the exchange rate of the end of May 2017). For more detailed information see rates of ER-Telecom on their web-site domru.ru. For comparison of Russian prices for telecommunications services and rates in other countries see, e.g., results of the studies of TMT Consulting presented by RIA Novosti on Dec. 26, 2016 (Available at https://ria.ru/economy/20161226/1484662033.html) (in Russian).

business of the incumbent,[205] and from different state efforts "aimed" at the solution of the "digital divide" problem. Nevertheless, despite of all of these aspects and despite the absence of any pro-competitive industrial policy, the market share of Rostelecom in 2013 was only 34.7% (J'son & Partners Consulting 2015). At the same time, the alternative regional companies had in 2013 about the same share of the market — 34.3% (J'son & Partners Consulting 2015). Three years later, the picture has changed noticeably: Rostelecom - 37.7% and the alternative regional companies - 29.9% (J'son & Partners Consulting 2017). Many of the regional companies over the period have been acquired by the major players of the market (J'son & Partners Consulting 2017), and the trend towards oligopoly of the broadband area is becoming more and more clear.

With the reincarnation of the former Soviet monopoly, the period of the competitive market in telecommunications has come to its final stage. The control over the main resources of the industry have been concentrated within the several powerful groups, and the current existence of the competitive field in the broadband sector is rather a matter of time. The new rules concerning installation of surveillance systems in the networks of telecommunications companies and extraordinary data storage requirements adopted in 2016[206] leave few chances for small and medium-sized enterprises to survive in the market, since the compliance with new requirements merely incompatible with opportunities of many of the independent undertakings,[207] while ability of the state to enforce the law has increased dramatically over the last several years.

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[205] In 2014, the Government decided that there should be the only one company of the Universal Service and this company is the reunified successor of the former soviet monopoly Rostelecom (Decision of the Government of the Russian Federation of 26.03.2014 N 437-p). According to the report of the Ministry of Communications (The information is available on the official web-site of the Ministry http://www.minsvyaz.ru/ru/activity/directions/193/) the annual payment of operators to the "Fund of the Universal Service" is about 15 billions Rubbles (About $245 millions according to the average exchange rate of 2015).

[206] Federal Law 374-FZ of 07.07.2016 (The so-called "Yarovaya Law" or "Yarovaya's Act").

[207] According to some estimations, one third of the total industry's cost of compliance with Yarovaya Law will be expenditures of small and medium sized operators (*Kommersant Newspaper*, March 6, 2017. Available at http://www.kommersant.ru/doc/3235190).

4.5. Summary and conclusion for Chapter 4

The Russian telecommunications industry not only poses quandaries for the mainstream theories, as noticed by Stiglitz (1999), it also provides a reasonable ground for reconsideration of the main assumptions and for reconstruction of the traditional hypothesis. The case explicitly shows that innovations in the industry do not require a high level of concentration, that all layers of the industry may have a competitive form and that the rivalry is able to flourish in the area even without regulatory efforts to promote competition. The important prerequisite for the efficient work of market forces is the absence of the control over the key resources by the most powerful players of the field. When the market environment allows newcomers to develop their networks independently from incumbents, they have opportunities to leapfrog the established players, and, these conditions, in turn, force the incumbents to innovate and to modernize their infrastructure.

Meanwhile, the common pattern of the "deregulatory" movement of the 1990s in different places of the world did not assume horizontal separation of the former monopolists and creation of the real rivalry in all layers of telecommunications. In Europe, for example, there was not only a lack of placement of all services in the competitive environment at the same time, but even competition in the area of telecommunications infrastructure was not allowed in the beginning of the process of "deregulation" (see, e.g., Larouche 2000).

The distinctive and doubtlessly positive feature of the privatization of the Soviet telecom monopoly in Russia was a separation of the company into state enterprises on regional basis. The personal interests of the managers of these enterprises as well as privatization of the telecom departments of Soviet industrial organizations allowed the appearance of competitive environment in the telecommunications markets of many Russian regions.

Despite the tremendous level of corruption and the usage of regulation in the interests of those who have had access to the regulatory mechanisms, the Russian telecommunications industry has been able to provide a high quality and a big variety of telecommunications services at significantly lower, in comparison with European, prices and has one of the best figures of the development of FTTx technology in Europe. Comparatively low level of concentration of the industry in the fixed markets has not undermined incentives of the industry's actors to invest in the development of their own infrastructure. On the contrary, this has forced even the

major players to implement new approaches and to increase the quality and availability of services. The successors of the Soviet monopoly, that eventually have been unified under RTK, had no chances to continue to be dominant players using their old copper lines in the places where their competitors developed FTTx networks, and, thereby, were stimulated to carry out modernization. All these examples allow to look at the arguments about any necessity of national and supranational consolidation of telecommunications assets for the future "digital health" of Europe (Vodafone 2015) and for the ability of telecommunications players to invest in the development of telecommunications industry (Thomson 2016) from a skeptical point of view.

The presence of the competitive landscape in some parts of the Russian telecommunications market, despite the captured regulation and the hostile environment towards the alternative market participants, allows to assume that telecommunications, in general, are able to be a quite competitive area of economic activity even without regulatory efforts for the creation of such environment. However, we have to admit that, firstly, the industry is very depended on the path of its development and can be locked on its previous highly concentrated forms, and, secondly, the regulation per se plays an important role in the formation of these "natural monopoly" conditions. Opportunities to circumvent the norms, to use the loopholes in the Russian regulatory frameworks and the usage of the positions of local incumbents' management at their own interests in some cases have played in favor of competitiveness and, thereby, albeit unintentionally, in favor of the public interests.

The fact that the gaming the system practices have helped preserve some parts of the industry in the competitive form and, at the same time, the lack of remarkable evidence of negative outcomes of such activity allows to conclude that any reasons for government interventions in the business of small alternative operators seem very doubtful. Even strict prohibition of piracy on radio waves is not apparent, especially in cases of existence of significant parts of white spectrum in rural areas, and the issue could be resolved by the openness of the frequencies on the secondary basis. Negotiations and liability, in fact, have allowed to solve the problem of interference by the alternative players, whose "illegal" usage periodically interferes with "legally" operated equipment or with networks of other "pirates".

However, it is important to note that not all parts of telecommunications in Russia have been able to demonstrate the competitive landscape. And this is not the problem of the attractiveness for investors, high sunk costs or the economies of scale.

This is not the consequence of market mechanisms, but the result of the control over development of the industry. The fixed broadband access market, where opportunities for regulatory gaming were comparatively high and the dependence on the business of incumbents was not significant, has shown the lowest level of market concentration among other parts of the industry. The rivalry in the market for local phone services, that has also allowed to game the system, has been remarkable but, nevertheless, limited by the necessity to rely on the conduct of incumbents in the issues of interconnection. The highest concentration in the Russian telecommunications sectors is observed in the market of mobile services, and this case is the vivid example how regulatory, but not market, mechanisms suppress competition.

The captured state institutions of Russia have been becoming stronger, and the consequences of this are not only the growing difficulties in gaming the system practices, but also the trends towards concentration of all industries, and the telecommunications are not excepted from this process. The landscape of Russian telecommunications has changed significantly over the last years. The Soviet telecom monopoly has been unified in the single gigantic company in accordance with the initial plans of the privatization of the industry. The mobile industry of about the whole country, that previously included many regional players, has transformed to a field for just four actors with a big probability, that this number will decrease further. The fixed broadband market, that in some instances had a low level of concentration, has experienced the significant number of acquisitions over the last years, and, again, there are many reasons to expect that these processes will continue. Nevertheless, the development and the period of the high competitiveness of some parts of the industry in Russia shows us that telecommunications in general are really able to have a highly competitive landscape and to allow market mechanisms to play an essential and positive role in the governance of the field.

CHAPTER 5

Impact of Regulation on Disruptive Innovations: the Case of Wireless Technology

The chapter is based on the article:
Trubnikov, D. (2017). Analysing the Impact of Regulation on Disruptive Innovations: The Case of Wireless Technology. *Journal of Industry, Competition and Trade* 17(4): 399-420.

"How is legal plunder to be identified? Quite simply… See if the law benefits one citizen at the expense of another… The person who profits from this law … will claim that the state is obligated to protect and encourage his particular industry… The acceptance of these arguments will build legal plunder into a whole system. In fact, this has already occurred."

Frederic Bastiat (1850), The Law

5.1. Introduction to Chapter 5

Despite the different views in Economics on the relationships between innovation and competition, some aspects seem pretty obvious and even trivial. The best incentives for innovation activity is "the difference in profit that a firm can earn … compared to what it would earn" otherwise (Gilbert 2006). Opportunity to escape competition and gain a monopoly and, thus, to charge prices higher than the competitive level is one of the main driving forces of innovations.[208] Therefore, the

[208] Such arguments are very common in the justification of the institution of intellectual property. See, e.g., Posner (2005).

conduct of a company that innovates is anti-competitive by its nature, but it does not mean that such behavior is undesirable from the point of view of social interests and, thus, is not considered in such a way by antitrust policy.[209] What is really desirable is that competitors of the innovator also have opportunities to innovate and positively affect the innovative conduct of the leader. However, at this particular point the triviality of the problem disappears and we enter the field of different legal and economics concepts, tools and methods of dealing with issues related to allocation of exclusive privileges and antitrust investigations.

The understanding that the aspiration of monopoly is the best incentive for innovation has moved the economics mainstream to the promotion of the idea that there are needs for government interventions that would provide exclusive rights for innovators. However, we can hypothesize that the market per se could be sufficient to the promotion of incentives for innovators[210] and, at the same time, could, possibly, make obsolete any needs to antitrust interventions. Therefore, it is quite risky to make conclusions that reasons for the victory of the leaders are their best business practices without paying attention to the fact that regulation played certain role in this superiority.

For instance, antitrust authorities might investigate the conduct of a company that had, allegedly, abused their intellectual property rights, inducing the discussion about the validity of such suspicion, but they cannot change the core of the problem, since the privileges to exclude others are precisely the main intention of the institution of intellectual property. They can be trying to assess the potential harm to consumers after a merger of some significant market players, but it might be a case when the structure of this market had been already transformed to the oligopolistic form by the regulatory policy and the real market forces have not already played a noticeable role in the field. Dogan and Lemley (2008) notice these shortcomings of antitrust law when they point out that "threats to competition do not come only from private conduct in unregulated industries, … [but] also come from government

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[209] Shelanski (2013), for example, notices that "Innovation inevitably leaves some firms behind and may confer market power on the innovating firm. … innovation greatly benefits consumers and should not be viewed as any more harmful to competition than when a firm cuts price and thereby leaves its rivals without customers".

[210] Fritz Machlup (1958), commissioned by Congress of the United States to evaluate the country's patent system, concluded that "If we did not have a patent system, it would be irresponsible, on the basis of our present knowledge of its economic consequences, to recommend instituting one. But since we have had a patent system for a long time, it would be irresponsible, on the basis of our present knowledge, to recommend abolishing it."

regulation itself. … Where it is the state itself that decides upon an anticompetitive end, the antitrust laws have not intervened."

Meanwhile, the problem becomes more complicated when the task of antitrust investigation is not only to develop the theory of harm to consumers, but to understand how the opportunities of market participants for innovations might be harmed.[211] However, it should be noticed that innovations very often come to our life in completely unpredictable ways, and, thus, it might be merely impossible to assess the potential harm for innovations if even the source of such unpredictable innovations is uncertain. What is more important is that the real threat for innovations comes not only from the conduct of leaders, but from the legal frameworks that determine such conduct and protect positions of incumbents.

One of the popular theories dedicated to innovations that appeared in the middle of the 1990s (Bower and Christensen 1995), and since that time has been embraced by many scholars, claims that "leading firms almost always triumphed in battles of sustaining innovation and that entrant firms typically beat the incumbent leaders when disruptive innovations emerged" (Christensen 2006). Disruptive innovation is one of those forces that can yield the real threats to established firms and "generates the kind of 'creative destruction' described by Schumpeter" (De Streel and Larouche 2015). Shelanski (2013) points out that due to the importance of creative destruction, the Schumpeterian approach, despite its arguments about the negative relation between competition and innovations, does not exclude antitrust interventions in the regulatory policy.[212]

Meanwhile, for established firms the best way to protect their positions is to capture the control over innovations, and here both kinds of innovations, sustaining and disruptive, are equally important to be controlled. In highly regulated industries, such as telecommunications, the "anticompetitive end" might be the result of regulatory activity, and the opportunities for disruptive innovations might be harmed by regulation.

Since the source of the disruptiveness is not always certain, the possible response to the attempts to control the development and innovations in telecommunications industry is the placement of the crucial resources of the field in

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[211] Some scholars pointed out that "[t]his calls for innovative theories of harm" (De Streel and Larouche 2015).

[212] Shelanski (2013) claims that "[a] natural implication of the Schumpeterian argument is that a firm with market power would … have an incentive to interfere with the cycle of "creative destruction" by impeding rivals' ability to develop new products or services that threaten its dominance."

the realm of "commons". Lawrence Lessig (2001) uses the similar idea when he talks about the control over the physical layer of a communications system. The problem is that the most of them by their economic nature are classic examples of private goods, since they are both rivalrous and excludable. Possibly, we could base some hypothesis on the enormous potential of the capacity of fiber-optic infrastructure, but since the access to this infrastructure has physical barriers, its exploitation in the way of an uncontrolled "physical layer" seems difficult. At the same time, the radio spectrum by its nature is the "common good", and it is quite possible that technological solutions might alleviate the problem of the rivalry of this good, and, thereby, transform it into the economic realm of "public goods". Another crucial resource of telecommunications, that is also by its nature is non-rivalrous and non-excludable, is information and knowledge that are controlled by the incumbents through the institution of intellectual property. It is possible to assume that the mechanisms of control over these resources maintain the oligopolistic structure of the field and facilitate the development of the mainstream part of the industry.

The purpose of this Chapter is to look at interdependence of different parts of telecommunications and to highlight the role of regulation in the support of the highly concentrated structure of the entire sector. This support has been expressed in the suppression of disruptive innovations in the industry, and the phenomenon is explained not mainly by explicit actions of government in the interests of incumbents, but rather by the dependance on the path of joint evolution of regulation and the mainstream technology. In the beginning of the Chapter, I provide a brief analysis of disruptive innovations in telecommunications and distinguish WiMAX as a real life example of disruptive technology in the industry, explain this position and describe the economic model of the technology. Then I use this case to demonstrate that the failure of this disruption was determined by state interventions in market mechanisms that, eventually, did not allow to put into practice the economic model, and protected the established status quo of the area. In the final section I argue that the current paradigm, that justifies regulatory interventions, heavily depends on the previous way of interaction of regulation and technology, and it locks the evolution of the industry on the mainstream technology, protecting business interests of incumbents.

5.2. Disruptiveness in wireless communications

5.2.1. Disruptive innovations in telecommunications

According to the concept introduced by Christiansen and Bower in 1995, innovations could be classified on sustaining, when innovations take place within the existing market and "tend to maintain a rate of improvement [providing] customers something more or better in the attributes they already value", and disruptive, when innovations "introduce a very different package of attributes from the one mainstream customers historically value". The initial version of the concept claimed that in the first phase an innovation performs worse than the main product or services in the market but with lower prices, and only in the second phase, the quality of the innovation increases and attracts the mainstream consumers. However, in more general view, a disruption comes not only from the "low end", but also from the "high end" (Govindarajan and Kopalle 2006) and from a "new market" (Christensen and Raynor 2003), and it might be claimed that one of the core features of disruptive innovations is their financial unattractiveness for the incumbents (Christiansen 2006).

We can find some noticeable examples of disruptive innovations in the telecommunications industry: Skype that has gained the benefits of the market of long-voice telephony, numerous Internet messengers, that partly substituted SMS services or even traditional voice services, or Internet video streaming services such as NetFlix. However, the majority of these examples share one distinctive feature that, in general, does not entirely fit the concept of disruptive technologies: entering the telecommunications market from the outside they have not undermined the positions of the incumbents of the industry.

Indeed, from this point of view these innovations of telecommunications services differ significantly from other examples of disruptiveness. The appearance of smartphones subverted the market of mobile phones and destroyed the business of the former leader of the market Nokia. The introduction of digital photo cameras ruined the business of Kodak. At the same time, the appearance of Skype, despite of the undeniable significance of the innovation for the industry, has not destroyed the business of British Telecom, Deutsche Telecom or Telefonica. There are some concerns of the incumbents about "commodization" of their services (Larouche 2007; Kushida 2015), but it does not mean the loss of their places under the sun.

The reasons for sustainability of the established players of telecommunications towards such kind of disruptive innovations are pretty apparent — these innovations

did not attack the infrastructure layer of the industry. They have changed the structure and the models of the business of incumbents, substituting voice or video traffic by data traffic, but not their positions. We can also notice that they broadened the borders of the industry and triggered competition on some of its layers, but did not challenge the core. Moreover, even appearance of many of these innovations was determined by the development of this core and their commercial success was merely impossible before the infrastructure layer reached conditions that allowed their proliferation.

However, even the infrastructure layer of the industry can also be challenged, and history shows us the case when the landscape of telecommunications could have been changed by disruptive wireless technology. From this point of view, WiMAX[213] might be to some extent considered as an attempt to construct an alternative infrastructure apart from the mainstream industry that could help to form an open and competitive environment in telecommunications.

Nowadays the story of WiMAX has already almost evaporated from the discussions of telecommunications researchers and many of the main actors of this scene even disappeared from the list of active players of the field (Alvarion, Redline, Aperto Networks, Airspan, etc.). Nevertheless, it is impossible to deny that, firstly, this story has had a significant value for development of the field. Secondly, the entire project cost a lot for the participants and, possibly, might be considered as one of the most costly undertakings that has ever existed in telecommunications and has not achieved success. Only Intel alone invested a huge amount in this idea, and that money was spent not only on R&D or production of WiMAX chipsets, but also on the deployment of wireless networks[214] and even acquisition of radio frequencies (*PCWorld*, May 8, 2008). By 2011 there were deployed more than 500 WiMAX networks worldwide (*Financial Times*, August 16, 2010), and vendors of consumers

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[213] For the purpose of this article the term WiMAX, that is an acronym for Worldwide Interoperability for Microwave Access, is used to refer to the IEEE 802.16 standard for wireless metropolitan area networks. The terms "WiMAX technology" or "WiMAX standard" in this paper describe the technology that complied with the sub-sets of IEEE 802.16 standard approved by the WiMAX Forum, the organisation that promoted the concept and coordinated certification of compliance with IEEE 802.16 and interoperability.

[214] The most noticeable example is Clearwire, where the company lost about 1 billion according to its Preliminary Fourth-Quarter Financial Information published on 7 January 2009 (Available at http://www.intc.com/releasedetail.cfm?ReleaseID=357860), but there were also Orascom Telecom in Egypt, Worldmax in the Netherlands, PIPEX Wireless in the United Kingdom, Unwired in Australia, Neovia in Brazil, etc. (*Intel News Release*, May 22, 2006. Available at http://www.intel.com/pressroom/archive/releases/2006/20060522corp.htm).

electronics supplied their devices with WiMAX chipsets inside.[215] Finally, this case might represent an interest for the empirical studies dedicated to the analysis of the impact that regulation has on development of technology, and to the analysis of the intersection of regulation and market mechanisms, that exposes that technological superiority or even first-mover advantage are not necessary conditions for the victory in the competitive environment in the presence of regulation.

5.2.2. Strategic inflection point in telecommunications

The theory of disruptive innovations initially appeared in management science (Bower and Christiansen 1995) and then was adopted by researchers of other areas of social sciences. Similar ideas can be found in papers of Andrew S. Grove, who was among the chief executives of Intel Corporation from the time of the creation of the company, and it makes a particular sense for the purpose of this chapter, since this company is one of the main actors of the story. In his works dedicated to management, Grove introduced the concept of "strategic inflection point" that is trying to describe a situation "when a major change takes place in [the firm's] competitive environment" and requires "a fundamental change in business strategy" (Grove 1998).

The end of the 20th century and the beginning of the 21st century might be considered as a "strategic inflection point" for many companies whose main business was in the fields of the new economy. Even those companies whose market positions seemed sustainable for the outer threats were under the risk to lose their business if their markets lose their attractiveness for consumers due to the technological advances and appearance of new solutions for the problems of human beings. The digital technologies of the 21st century provided opportunities for such disruptiveness and left entire markets in the annals of history. Examples are markets of tape recorders and cassette tapes, analog photo cameras and photographic films, cable radio, matrix printers, cathode ray tube technology, etc. Meanwhile, not only the digital world threatened positions of companies that achieved their success in the 20th century – the development of digital technologies also threatened the status quo of the digital marketplace. Grove (1996) pointed out that Intel, whose main business

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[215] For example, in the list of WiMAX Certified products that were approved for the usage in the WiMAX network of Japaness company UQ Communication there are laptops and tablets produced by Lenovo, Acer, Sony, Panasonic, Toshiba, Fujitsu, etc. Information available at the website of the company http://www.uqwimax.jp/english/annai/certification/info.html

was production of dynamic memory chips and who was one of the leaders of this market, in the middle of the 1980s had a real risk to lose everything and only the decision to change the business and to move the focus on manufacturing microprocessors allowed the company to protect its positions and to reach worldwide leadership in the growing market of personal computers.

The threat to the positions of a company comes not only from the industry where it is active, but also from external markets, and in the case of personal computers, the threat could be expected, and now we observe its materialization, from mobile devices. From the beginning of its appearance, the mobile phone has been more and more transforming to a device with computational capacity that allows to execute a big variety of different tasks. Modern tablet PC already might be considered as a real substitution for traditional personal computers,[216] but the main players of the market of components for these mobile devices are not the same as were in the market of components for personal computers. The growing industry of mobile devices has been the real, albeit long-term, disruptive innovation for the established industry of personal computers, and the top-managers of the incumbents of the latter at the turn of the centuries could already understand it, and, moreover, it could be quite tempting for them to extend their business to the new area.

Meanwhile, to become a leader of the new field was not easy even for such giants as Intel Corporation. The incumbents of this market controlled the field through numerous patents for the essential technologies. Qualcomm in 2000 was already "emerging as a kind of Intel of the wireless era" (*FORTUNE Magazine*, May 15, 2000), and ARM Holdings, that licensed its processor designs to other chip-makers including Qualcomm, Apple, Samsung and others, has become a sort of standard in the growing industry of chipsets for mobile devices. We can find figures that show that in 2006 about 98% of all mobile phones already used ARM solutions on their motherboards, and, moreover, the company had plans to extend its business and to become "the architecture for the digital world" (*CNET*, April 3, 2006).

The alternative to the entry to this field could be creation of a new technology and a new market based on this technology, that would be able to substitute the next stage of the current way of development of the industry. Therefore, the task could be to find ways for the creation of this market and alteration of the trajectory of the development of the industry toward the new technology. In other words, the task was

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[216] In 2010, Steve Jobs already proclaimed that the Post-PC era has arrived (*TechRepublic*, June 2, 2010)

creation of a disruptive technology for telecommunications in general. In order to protect its positions in the entire semiconductors industry where growing market of mobile devices threatened the established order, such companies as Intel had to introduce their own disruptive innovation for the new field.

5.2.3. Disruptiveness in different layers of telecommunications and the economic model of the wireless innovation

In general, WiMAX was not the only example of wireless technologies that could threaten the established telecommunications business at that time.[217] Moreover, we can find information that before taking the leadership in the WiMAX Forum, Intel executives also considered the alternatives, but finally stopped their choice on this technology, because they saw that "only WiMAX drove the technology with economic model" (Fitchard 2008).

When Intel took the leadership in the WiMAX Forum, the concept of the technology had been transformed from "an access alternative", that aimed to be as a wireless solution for the last mile problem, to "a platform for mobile computing" (Fitchard 2008). The way of the development of telecommunications industry traditionally had in its core voice services, while data transfer had been gradually added to the technology. The opportunity for disruptiveness was to turn it upside down and to put the data transfer in the core of the system, while voice services could be just a part among other opportunities provided by the technology.[218]

Meanwhile, WiMAX was not an innovation that could be brought to the market with efforts of just one creative company, it was a concept that threatened the status quo of different markets and assumed joint actions of many players from various layers of telecommunications. The result of these actions could be expressed in alteration of all of these markets, formation of new business models and creation of new leaders. If Intel was seeking the ways to extend its semiconductor business in the new area, there were players in other fields that understood their possible benefits from new markets that could be created by the technology.

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[217] We also can notice Mobile Broadband Wireless Access specification IEEE 802.20 or other subsets of IEEE 802.16 such as WiBro.

[218] Intel fellow and CTO of Intel's wireless group Siavash Alamouti described these Intel's attempts to enter the wireless market in the following way: "…this is not an Intel-versus-the-wireless-industry situation… [but] the computing and electronic industry versus a telecom industry traditionally dominated by voice". (Fitchard 2008).

From the perspective of telecommunications business, WiMAX was not attractive for incumbents of the mobile industry, especially for those who already invested in the creation of 3G infrastructure (Conti 2005). WiMAX did not assume the evolution of the networks of mobile providers, but instead required new investments in the creation of new networks that would operate separately from the cellular networks. Of course, some core parts of the networks infrastructure might be used for different kinds of networks, but, nevertheless, the adoption of WiMAX for mobile carriers could signify excessive investments in the equipment without returns from the previous undertakings (Weil 2009, p. 9). In other words, sunk costs associated with their current way of development made adoption of the non-mainstream innovation highly unattractive to their business models. From this point of view this technology perfectly fits one of the important features of disruptive innovations that was noticed by Christiansen and was highlighted in the beginning of this paper, namely, the financial unattractiveness for incumbents. However, it does not entirely mean that mobile service providers would never develop WiMAX networks. In order to preserve their positions and to broaden the spectrum of services they could not entirely reject WiMAX technology, but they were reluctant in their response to the emergence of this innovation and it was, definitely, not the best way of the development of the industry for their business models.[219]

The technology was not only unattractive for the established mobile operators, but also for the incumbents of the traditional wired telecommunications industry. Many of them already had assets in the mobile business and, thus, there were no reasons to create competition with other units within their companies. Reasons for the adoption of fixed WiMAX solutions were even weaker than the possible embracement of the mobile version of the technology: the implementation of fixed WiMAX for remote areas might be less attractive business then the monopolistic development of wired infrastructure through the government subsidization of the universal service, while creation of such networks in parallel with their existing networks simply made no sense.

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[219] Moreover, even for the incumbents of the mobile world WiMAX still could be interesting as a strategy for entry in the new territories, and, as a result, we can find examples of deployment of WiMAX networks by the world leaders of mobile communications. For instance, there were networks of Vodafone under the brand Vodacom and the former French monopoly Orange in some African countries, but, again, it rather show the possibility of the usage of the technology for disruption of existing or creation of new markets.

Meanwhile, by the middle of 2010 the total number of deployment of WiMAX networks reached 500 in 147 countries (*Financial Times*, August 16, 2010). In some of these cases it was an attempt of provision of mobile services, but in many it was competition with incumbents of wired telecommunications and even a natural solution of the digital divide problem.[220] WiMAX, despite of its unattractiveness for established players of the field, opened doors for newcomers or helped to solve the "local loop" problem for those who otherwise had to rely on the incumbents' infrastructure.

In 2004, Intel executives claimed that WiMAX technology will "truly usher in the broadband wireless revolution" and saw three phases of the deployment of the technology: 1) outdoor solutions, 2) indoor solutions, 3) mobility (*Intel News Release*, Jan. 21, 2004). This three-phases evolution approach was included in the plans of certification of WiMAX equipment, and there were proposals that this upgrade on the higher phases might be done through the installation of new versions of software, while the hard core of the network would remain the same. The third mobile phase of the technology was later considered as one of the possible versions of 4G mobile telecommunications, however, this candidate for 4G was not an evolutionary path of the mobile technology, but the mobile version of the fixed wireless technology.

There were several issues for those who considered to invest in this sort of business, and the economic model of WiMAX had to have a solution for these problems in order to find widespread adoption. First of all, the price of the network equipment and end-users terminals had to be significantly lower than those provided by competing technologies, and in different phases of the development of the technology different alternatives could be considered as rivals.

Secondly, there was a necessity to avoid the high costs of installation of end-users equipment, and it was an issue in the first two steps of the development of the technology, that were based only on the solutions for the fixed broadband access.

Thirdly, the technology must provide a cost-effective solution for the architecture of the network in the sense of the coverage area of a base station and required number of the base stations. It should take into account such aspects as the absence of a line of sight between base stations and end-users terminals and the necessity to arrange high speeds connections.

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[220] Some even considered WiMAX as a possible "cost effective solution to answering the challenges posed by the digital divide". (Yarali, Mbula, and Tumula 2007).

Then, there should be a solution for the network infrastructure. The technology allowed to solve the problem of the last mile, but it was not less important to understand how the core of the network could be connected with other network elements and, moreover, how it could be interconnected with other networks. This task could not be solved solely by technological means, and required active participation of government in the promotion of development of infrastructure and competition in this area. It was already clear by the time of the appearance of WiMAX that "[s]uccessful competition for infrastructure can reduce the needs for access regulation" (Canoy, De Bijl, and Kemp 2003, p. 71). At the same time, the European approach that aimed to the promotion of service-based competition was not the best solution for infrastructure development and some recent researches point out these shortcomings of European regulation (Yoo 2014).[221]

Finally, maybe the most important issue that had to be solved for the attraction of investors and entrepreneurs is the creation of expectations that this technology will change the world of telecommunications. Investments in the creation of WiMAX networks for the provision of services in underserved areas could be a question for new adepts of the technology, but if to consider the outdoor solutions for the coverage of these areas as just a first stage in the formation of the future mobile business, then this activity is merely a necessary part of the whole business model where the desired pay-off will be achieved later.

The leadership of such company as Intel in this project was a noticeable signal about the commitments of serious players towards the technology. Mo Shakouri, who was a vice president of WiMAX Forum, pointed out that "without Intel's support the WiMAX industry never would have moved so fast" (Fitchard 2008), and this speed of the development of the project increased expectations of investors. In September 2007, Intel's WiMAX plans were more than ambitious: 150 million subscribers worldwide one year later in 2008; 750 million, more than 10% of the world population, in 2010; and 1.3 billion in 2012 (Gardiner 2007). Paul Otellini, CEO of Intel of that time, claimed that the industry is moving toward ultra mobility and "WiMAX … will be the network that provides that" (Gardiner 2007).

To summarize, the success of the technology required its widespread adoption that could be achieved through interoperability, solution of the cost-effective network architecture issue, provision of expectations of the future alternative

[221] For the discussion about advantages of facilities-based competition see also Lemstra, Voogt, and van Gorp (2015), De Bijl (2005). See also the arguments in the previous chapters.

telecommunications market and assistance of governments in the creation of the backbone infrastructure, and would allow to decrease the prices of equipment and to eliminate the costs of installation. At the same time, these tasks were highly complicated by the issues of the allocation of radio frequencies and by the industrial policy, and, moreover, the failure in the finding of the solution of these problems merely signified that the primary goals would not also be achieved.

5.3. The role of regulation in development of wireless technology

Technological change is not an independent process as it is assumed by technological determinism, and the market is not the only social institution that influences technology (MacKenzie and Wajcman 1999). Regulation co-determines the development of technologies and even technologies that will be embraced by society, as well as technologies that would be thrown away from the main course of technological development. Butenko and Larouche (2015), for example, argue that "regulation affects which inventions are made, which are developed, and which are not, as well as which take off, and which do not". The interaction of technological change and regulation defines the actions of industry players and shape the architecture of the network and characteristics of the key technologies, and telecommunications provide us good examples of how "all changes in regulation produce important consequences on the organization of the industry that in turn … have important consequences on the technology" (Antonelli 1995). What is more interesting here and what might be referred from the case of the WiMAX story is that in the current regulatory regime the market plays a quite secondary role in this process. The victory in the battle between the evolution of the mainstream technology and the disruptive technology proposed to the market from the outside was not determined by the superiority of technological solutions or even more sustainable business models of the established players, but was a consequence of regulatory decisions and legal norms in some key aspects. Eventually, the economic model of WiMAX could not solve the problems highlighted in the previous section and there is a clear relationship between this failure and the government interventions into the market.

Indeed, among the studies dedicated to the comparison of mobile WiMAX and LTE we can find that LTE did not have technological superiority[222] and, thus, earlier WiMAX appearance in the market could have played as a first-mover advantage. The business models of the mainstream operators could be threatened by the appearance of newcomers, but chances to succeed in the telecommunications marketplace for those who were eager to launch the new wireless business were significantly affected by the regulation of the field.

The deployment of wireless networks heavily depends on the ability of telecommunications operators to get radio resources. Only very limited parts of the radio spectrum through out the world are accessible on the free basis, while mostly commercially interesting radio resources are under the control of governments everywhere, and, moreover, these resources have not been available for "two guys in a garage"[223] who could have brought the disruption into the markets of telecommunication services. On the contrary, the social utility from the economies of scale, and understanding of the best ways of its achievement incorporated in the economics mainstream, have always ruled the decision makings concerning the radio spectrum allocation, and instead of distribution of the radio spectrum for a number of entrepreneurs, it has always been allocated to small groups of big service providers.[224]

There is also another area of government interventions, that is very relevant to the field of wireless technology, as well as to the industries of the new economy in general, and this area is the institution of intellectual property. As it was mentioned in the beginning of the paper there is no consensus about the scope of necessary interventions and even a necessity to create incentives through the provision of exclusive rights. This section analyzes the impact of both of these aspects, the government intervention in the area of radio spectrum use and allocation of exclusive rights to objects of the intellectual sphere on the eventual defeat of the disruptive wireless technology by the mainstream part of the industry, and, at the same time, discusses the possible positive role of regulation in the promotion of technological pluralism in the industry.

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[222] Some even claims, that WiMAX performed better in some cases (Roodaki, Raahemifar, and Raahemi 2014).

[223] The term here is adopted from Christensen, Hatkoff, and Kula (2013), who notice that "Disruptive innovations are … products or services, often created by "two guys in a garage"."

[224] Melody (2012), for example, notices that in the EU "[t]he liberalisation objective of stimulating competition and opening access apparently was not considered to be the cornerstone of spectrum policy".

5.3.1. Radio spectrum allocation

One of the main aspects of the legal frameworks that has always influenced the development of the industry is regulation of the radio spectrum, and this is not limited to the market of telecommunications services, but also affects the market of manufacturers. The problem is not only that the state allocates rights to use radio waves, but it also determines how the spectrum should be used, and this particular issue makes innovation dependent also on policymakers, but not only on creative minds.[225]

The developers of the WiMAX standard from the very beginning had been struggling with the necessity to comply with spectrum regulation that was different in different places and, thus, availability of the parts of the spectrum for the future deployment of networks was also different. For example, the report of the OECD (2006) pointed that "Much of the success of WiMAX hinges on the ability of operators to find appropriate and available spectrum", and that "without a globally recognized frequency band, the economies of scale will be reduced". It was also clearly understood by the members of WiMAX Forum and was expressed in its official papers dedicated to the regulatory issues (WiMAX Forum 2004).[226] Furthermore, the developers, in order to mitigate the problem and to find some intersections in the regulation of spectrum in different countries, were trying to adjust technical features of the technology to these common points by reducing, for example, the required bandwidth for a channel or the transmission power. However, at the same time, it limited the capacity of the technology.

Even in the 3.5 GHz band the regulation of some countries (e.g., Sweden or the UK) directly prohibited mobility of telecommunications services "other than 3G services" (OECD 2006, p. 21). Therefore, while in the higher band (5.7 GHz) mobility was limited by the laws of nature, in the band 3.5 GHz there was allowed only the competition with DSL due to the legal rules. In some jurisdictions there were restrictions on the coverage area of base stations that reduced the benefits of the

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[225] The concept of technology neutrality is able to some extent alleviate the problem, but this principle was widely adopted by the industrial policy only after the mainstream of wireless technology defeated the main competitor, which at that moment was WiMAX.

[226] The paper notices "the uniform allocation of spectrum worldwide, is crucial to lowering equipment costs because radios are a major cost component in developing WiMAX Forum Certified systems".

cost-efficiency of the network infrastructure.[227] Regulation of the usage of radio spectrum in several countries prohibited real mobility in wireless broadband networks, restricting the speed of end-user devices of such networks to the speed of pedestrians (OECD 2006). Moreover, the most suitable radio band for the mobility of WiMAX specifications, 2.5 GHz, was reserved for the evolution of the mainstream technology by the International Telecommunications Union, an agency of the United Nations, under the IMT-2000 umbrella, and, thus, could not be used in many of the world countries before the inclusion of WiMAX in the IMT-2000 family (OECD 2006).

The future rules were not determined and were unclear for those who considered to play this game, and, thus, increased risks of such investments. At the same time, for those who already had their business within the established order, such uncertainty was not a problem - they had time to wait, to lobby their interests and to adjust their networks to the sustaining innovations of the mainstream technology. Even the disruptiveness of the technology could not provide enough incentives for investors if the future of the regulatory attitude towards the use of radio frequencies was so uncertain. The unclear situation with the possibility to use lower parts of radio spectrum (e.g. 2.5 GHz) on the third mobile phase of the technology significantly reduced the attractiveness of projects related to the first fixed phases for the potential investors.

About all factors of the success of the technology highlighted in the previous section heavily depended on the decisions of policymakers: the price of technological solutions required economies of scale that could not be achieved without global adoption of the standard, the limitations imposed on the usage of wireless networks affected the cost-efficient architecture and the costs of installation, the uncertainty and the restrictive policies on the mobility decreased the expectations. Even solution of the problems of interconnections and backbones in many places of the world required government assistance and could not be solved independently from incumbents. In countries with a low level of concentration in the industry, with advanced fiber-optic infrastructure that was not totally under the control of incumbents and where there were possibility for its costs-efficient construction, like in Russia, the main issue in the entrance to the wireless market was a solution of the

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[227] For example, in Russia the coverage area of WiMAX base station in the 3.5 GHz radio band was restricted to 3 km with the maximum power of radio transmitter -10 dBW. The same maximum power of radio transmitter was established for Wi-Fi (Decision of GRFC 28.11.05 № 05-10-01-001), and compliance with such rule merely made the economy of such networks quite doubtful.

radio frequencies allocation problem, while in those countries where telecommunications infrastructure was just recently opened for competition or was under the total control of incumbents the problem of entrance was more complicated.

The WiMAX technology was unable to achieve global adoption, and the final stage of the life of the project began in 2010, when it already became apparent that the mobile version of the standard lost the battle with LTE. This period revealed some examples that show that expectations of those who invested in the WiMAX projects hoping to obtain in the future the broader parts of radio spectrum and to extend their services were wrong. Dutch company WorldMAX[228] was forced to shutdown its WiMAX network in June 2010 because the government, in excuse of national security, put restriction on the license of the company regarding the usage of radio spectrum (Vos 2010). Just one month before, the company Freedom4[229] left the market of telecommunications services in the UK because the regulatory policy did not permit provision of mobile services on the WiMAX network of the company (Baker 2010). However, strictly speaking, mobility in the radio band 3.5 GHz is limited also by economic rationales, but what is more relevant to the problem is that the company was also unable to get frequencies in the 2.6 GHz radio band (Baker 2010).

The similar problem of impossibility to extend the radio resource of deployed fixed WiMAX networks into the radio band that allows mobility was observed in other parts of the World. The main explanation of this situation is that these radio resources were obtained by the mobile incumbents for the development of their networks,[230] and for them, as described earlier, WiMAX was not the best alternative among WiMAX and LTE.

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[228] According to some estimations, Intel Capital and Enertel Holding jointly invested 37 million USD in the creation of this network in Amsterdam. (Higginbotham 2010)

[229] This company was also the project with investments of Intel Capital (*Intel News Release*, Feb. 11, 2008)

[230] Possibly, the most noticeable exceptions from this pattern were Clearwire in the US and Yota in Russia, but in the latter case the company gained frequencies and got opportunities to deploy networks in most of the Russian regions when WiMAX was already doomed and the company turned its efforts towards LTE.

5.3.2. Issues of intellectual property related to wireless technology

As was noticed above, the economic model of the wireless technology requires a cost-effective network infrastructure. This could be achieved only if the technology incorporates the most advanced relevant technological achievements that existed in the industry at that time. In the world where ideas are not free and the owners of intellectual goods have rights to exclude others from the participation in the technological progress, the entities that were able to concentrate the rights on the most essential solutions for technological development have power to affect the total outcome of the industry. In the analyzed case such "intellectual monopolists"[231] had very apparent interests in the promotion of the mainstream of the wireless telecommunications, rather than to allow disruptors to challenge their business positions.

Ericsson, the leader of the market of mobile networks equipment, joined the WiMAX Forum in 2004 (*Ericsson Press Release*, Dec. 13, 2004). The company has had "one of the industry's strongest intellectual property portfolios" (*Ericsson Press Information*, Feb. 2007), but has never been among the manufacturers of WiMAX equipment. Among those who were able to significantly benefit from the technology and who really produced certified WiMAX equipment were such companies as Alvarion, Airspan, Navini, Aperto Networks, etc. These companies might really be considered as outsiders of the market of wireless equipment and as disruptors of the established market. However, in the case of the victory of WiMAX in the competition for 4G standard they could get a portion of the pie. Some researchers argued that wide adoption of "WiMAX as a 4G standard would be crisis for Ericsson and Nokia Siemens Networks", and, as a result, these companies had to adjust their strategies to the promotion of LTE, and intellectual property rights could be a powerful tool for the achievement of such goal (Seo 2013, pp. 169-171). In 2006 Ericsson terminated its participation in the WiMAX project and devoted its resources to HSPA and LTE. WiMAX was rather the threat than the opportunity for the company that controlled about the third of the mainstream market.

The most noticeable player in the sphere of mobile standards, Qualcomm, was also among those who had opportunities and incentives to determine the future of wireless technology, and, according to the claims of some experts, openly opposed the

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[231] The term "intellectual monopoly" here is adopted from Boldrin and Levine (2008).

development of WiMAX (*Bloomberg*, September 3, 2007). In 2005, The Economist, describing the role of Qualcomm in the third generation wireless networks, claimed that "[b]ecause its technology underlies the third-generation mobile-phone standard, Qualcomm has become a toll bridge that all equipment-makers must cross" (*The Economist*, Oct. 20, 2005). In 2005 - 2006, Qualcomm significantly increased its patent portfolio concerning, inter alia, crucial solutions for WiMAX technology by the acquisition of the developer of MIMO technology[232] Airgo and the pioneer and developer of OFDM technology[233] Flarion, and became the holder of "the most widely licensed in the industry" patent portfolio that "applies to all existing 4G standards … including … LTE … and … WiMAX" (*Qualcomm's LTE/WiMAX patent licensing statement*, Dec. 2008). Some experts, commenting the acquisition of Flarion by Qualcomm, even claimed that "Qualcomm has now got its hands on all future mobile technology", and directly pointed out that, as a result of it, "WiMAX … might face problems" (Lewan 2005). From the perspectives of disruptiveness of the mainstream wireless business for the market of traditional PC and WiMAX for the mainstream telecommunications, such actors of the semiconductors market as Qualcomm had clear reasons to be in favor of the wireless mainstream.

In order to help to promote the WiMAX technology in the middle of 2008 Intel jointly with Cisco,[234] Samsung, Alcatel-Lucent and telecommunications service providers Sprint Nextel and Clearwire formed the patent pool Open Patent Association. The primary goal of the organization was proclaimed "to foster a global ecosystem focused on delivering broader choice, competitive equipment and service costs for WiMAX technology, devices and applications".[235] However, they did not manage to attract to this patent pool all companies that possessed the essential patents for the technology. The response of the mainstream industry was the commitments of the main patent holders "to a framework for establishing predictable and more transparent maximum aggregate costs for licensing intellectual property rights (IPR) that relate to 3GPP Long Term Evolution" (*Ericsson Press Release*, April 14, 2008).

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[232] MIMO is an essential element of many modern wireless standards.

[233] OFDM is a method of encoding digital data that has also found wide application in the wireless standards.

[234] The company in 2007 for $330 million acquired noticeable player among WiMAX manufacturers Navini Networks (*FORTUNE Magazine*, Oct. 23, 2007).

[235] The website of the organisation is available through Internet archive https://web.archive.org/web/20110727151012/http://openpatentalliance.org/

Qualcomm did not join any of these agreements, but introduced in the same year their own FRAND patent statement. Qualcomm put it in the way that LTE and WiMAX "will be used to complement existing 3G deployments to help address the growing demand for mobile data", but the initial purpose of WiMAX was not the complementing of 3G deployments. The technological and logical continuation of 3G networks could be only LTE from these two alternatives, and it was clear for the senior executives of Qualcomm. Peter Lancia, Sr. Director in Marketing of Qualcomm, noticed that "LTE will provide a parallel evolution path to 3G, and will leverage 3G's scale and ecosystem of vendors, operators, consumers and application developers" (*OnQ blog* at the Qualcomm's website, May 25, 2010).

5.3.3. Promotion of competition and technological pluralism in the industry

Although the promotion of competition is among the priority goals of the industrial policy, the reality of modern days shows us that all layers of the industry have been becoming more and more concentrated, and this concentration takes place on the global level. By 2015, the major part of the market of mobile infrastructure equipment was already under the control of just four companies: Ericsson, Nokia, Alcatel-Lucent and Huawei, and nowadays, when Nokia finally gained control over Alcatel-Lucent, the oligopolistic structure has become even more prominent. The number of mobile service providers has also declined, and some European mobile markets have already changed their structure from four to three operators (Austria, Germany, Ireland, etc.).

The analysis of this paper is drawing the link between the regulation and the ongoing process of concentration of the industry, but this does not mean that in the pure laissez-faire system we would not face the similar problem or a set of other issues. As it was noticed above, the success of WiMax was practically impossible without assistance of governments in the creation of the backbone infrastructure and efficient solutions of the problem of interconnection. These crucial resources were under the control of incumbents, and for them the alternative development of the industry was not the best possible option, while new entrants, who could bring the disruption in the market, were in a dependent position from the conduct of the giants, and only industrial policy aimed at the promotion of technological pluralism and competition could alleviate the problem.

At the same time, if the aim of the competition policy is the promotion of competition between the main players, who already invested in development of the mainstream technology, but not facilitation of access for new entrants and opening doors for them for bringing new technologies, then we can hardly expect the appearance of innovations that threaten the mainstream course of the development due to the problem of sunk costs of the incumbents. Antonelli (1995) in his analysis of technological change in telecommunications points out that "the larger the variety of independent players, the larger the opportunities to generate new technologies", and it has a particular sense for the recent story of the wireless industry. There were a number of sets of 2G standards, then there were just two 3G sets of standards, and there is the only one standard considered as 4G technology. However, if the technological pluralism was a target of the industrial policy, then we could expect not only to have the diversity, but also to observe the continuing process of creative destruction in this viable field of the new economy.

5.4. Mutual shaping of technology and regulation in telecommunications

The regulation of telecommunications has evolved since the appearance of the industry, addressing its efforts to new issues that have been arising with the development of the technology. However, not only technology raises problems before policymakers and affects legal norms, but legal norms, in turn, affect the development of technology. In social sciences dedicated to regulatory issues this idea is expressed in the concept of mutual shaping of technology and society (e.g. MacKenzie and Wajcman 1999). Meanwhile, in a case of disruptive technology in highly regulated industries there could be an issue, because the law has been developing along with the mainstream of the industry and it has created the playground for the mainstream players, while for the technology that assumes an alternative way of the functioning of the field the old rules could be inappropriate or even hostile.

In other words, law and technology not only mutually shape each other, this mutual shaping process is able to form the high level of dependence on the previous way of development and protect the mainstream course of the technology from external threats. Many scholars point out the problem of "regulatory disconnection" (Brownsword and Goodwin 2012; Brownsword and Somsen 2009) or

"pacing problem" (Marchant, Allenby, and Herkert 2011), the situation when the pace of development of technology is faster than of the law that aims to regulate this technology (Butenko and Larouche 2015). The WiMAX case shows us that industrial policy in highly regulated industries is able to adjust itself to sustaining technologies, even if with the time lag, while this disconnection impedes disruptive innovations. As a result, the incumbents of the field might even benefit from this pacing problem.

If, for example, there was no problem of interference, then there would not exist any need to solve this problem through regulation, but, at the same time, if this problem can be solved by means of legal tools and there are obvious beneficiaries of this mechanism, then the necessity to seek alternative ways of its solution is not so actual, unless it fits the aims of the main industry's actors. Moreover, even when technology is already able to provide such solution, and nowadays we can hear claims that this time has already come (e.g. Werbach 2004; Staple and Werbach 2004), the regulation is very reluctant to change its paradigm. The new technological paradigm might signify not only dramatic alteration of regulatory approaches without clear understanding of the final results, but also may have a significant negative impact on the business interests of current major players, and, thus, this regulatory shift is not desirable neither for the incumbents nor for the policymakers.

This is not only the case of radio spectrum or industrial policy of telecommunications in general. It is the pattern that can be found in many cases when a regulated industry faces disruptive innovations. Uber or Airbnb, for instance, have also experienced numerous obstructions from the side of regulation.[236] However, the attempts of policymakers to protect the established business interests is not necessarily a case of regulatory capture, but also their natural response to the threats to stability, since new technology might convey unpredictable consequences.

It is also necessary to notice that some innovations, like, for example, implementation of BitTorrent protocol that has disrupted the copyright industry, or mentioned above Uber or Airbnb, have a crucial advantage compared to innovations in wireless telecommunications. They provide more opportunities for their users to disobey the law, and, thus, have more chances to success, while in the case of wireless technology the deployment of a network might require a high level of investments without the possibility to dissolve this activity in the ocean of other radio pirates,

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[236] One of the Wikipedia articles is even dedicated to the "Legal status of Uber's service". Airbnb also has the explicit opposition of regulation in many parts of the world: Canada (*Montreal Gazette*, April 29, 2015), Germany (*Guardian*, May 1, 2016), Russia (*RBC*, Oct. 8, 2015), and so on.

and that increases risks of potential "violators" and enhance the opportunity for law enforcement.

At the same time, the problem of impediment to disruptive innovations due to regulatory disconnection could be alleviated if the crucial resources of the field were accessible for a big number of potential newcomers. In the same way as the end-to-end principle of the Internet architecture facilitated growth of diverse online services (Lessig 2006), the physical layer of the industry could also make possible the appearance of new disruptive technologies and business models if the industrial policy were aimed to promote accessibility of the resources.

Of course, there is no shortage of justifications of limitations of freedom of potential radio spectrum users from the positions of the public interest, but it is also necessary to notice that more and more scholars nowadays claim that if we take into account the modern technologies, then many of these assumptions are obsolete (see Werbach 2004; Staple and Werbach 2004; Milgrom, Levin, and Eilat 2011). Moreover, the ideas that radio spectrum, or, at least, some of its parts, represents a common resource that should be returned to the realm of commons have become popular among many scholars (e.g. Benkler, 2002; Lessig, 2001; Werbach, 2001). However, it is also possible to admit, that, on the one hand, this discussion about openness of radio spectrum could be quite futile without robust economic models that could drive innovations in this field providing numerous benefits for various strata of society, but, on the other hand, it is difficult to expect the appearance of such models without understanding the possibility of their implementation due to the total control of the resource in the interests of major players.

The idea of the open spectrum emerged before the appearance of WiMAX, and, indeed, the widespread implementation of this concept could become the significant part of the growing sharing economy. It is difficult to say now whether WiMAX or another wireless technology with the similar idea could really benefit from the openness of radio, but we can hypothesize that in this case this technology had more chances than the long term evolution of the mainstream. However, we cannot truly say that WiMAX Forum aimed the efforts to promote the technology within the open spectrum concept, but the comparison with Wi-Fi, that mainly operates in the unlicensed frequencies, was one of the main parts of the leitmotif of the story (e.g. *Intel News Release* [Intel Outlines Broadband Wireless Vision], Jan. 21, 2004). Moreover, WiMAX camp considered the operation of WiMAX networks in the license-exempt parts of radio spectrum (Intel 2005). The license-exempt 5 GHz band

was among the "initial bands of focus" (WiMAX Forum 2004), but this radio band increases requirements of line of sight and, thereby, decreases the commercial attractiveness of the technology.

Meanwhile, innovations in the unlicensed parts of radio spectrum are able even to change the core assumptions of the mainstream economic models. For example, the phenomenon of community networks, where the infrastructure is a common-pool resource, hardly fits the mainstream understanding of the economics of telecommunications. Such networks provide services for dozens of thousands of subscribers and compete with the giants (Baig et al. 2015), but, again, one of the problems of their development is the access to the resources that are necessary for creation of this common infrastructure. However, if the scenario of the WiMAX camp about the widespread adoption of the technology and significant reduction of prices of WiMAX equipment was fulfilled, then this technology could be a powerful tool for such innovative business models. Moreover, the mesh topology of network architecture, that Benkler (2002) described in the model of the "Ideal Open Wireless Network", and that is widely used in the wireless community networks, was placed in the agenda of the evolution of WiMAX (Wei et al. 2005).

In the field of intellectual property WiMAX proponents promoted the idea about open patent system for the technology "[t]o help ensure product differentiation and interoperability at a more predictable cost" (*Intel News Release*, June 9, 2008), but they were not able to include in this pool the essential claims of the opposition of this technology, and again, it exposes the development of the mainstream institutions of our society that, even if unintentionally, protect the established status quo.

Although the institution of intellectual property and allocation of radio frequencies both represent the examples of government intervention in the mechanisms of the free market, they are quite different by their nature. In the case of radio spectrum distribution, the problem is based on physical characteristics of radio waves, that are expressed in the limitation imposed by the mother nature, while in the second case this is mainly an attempt to provide a utilitarian solution for economic issues, but not the problem imposed by the physical features of our world.

If we consider regulation as the institution that forms the common playground for different actors, then we might expect to see the difference between institution of intellectual property and norms of allocation of radio frequencies. Government establishes the same rules for all members of society to get protection on the results of creativity of human minds, and, theoretically, anyone can use these mechanisms for

his business purposes. There is a restriction for the usage of a particular idea, but not the restriction for the use of alternatives.[237] At the same time, the allocation of radio frequencies a priori does not assume the pluralistic landscape of commercial wireless networks and allows to allocate these privileges only to a very limited number of actors. However, it is possible to argue that this difference in some cases is mostly theoretical. Inventions might be essential for the entire industry without possibilities to invent around,[238] and, thus, it could be an analogy between property rights on such resource and property rights on an essential part of the radio spectrum, merely because it might be the absence of alternatives in both cases. Since the technological inventions are not the result of individual genius but the natural consequence of technological development of our civilization,[239] even patent races to some extent might be considered as an analogy of "races" for radio frequencies, and, thus, both these institutions similarly promote the ongoing process of concentration of the field.

The optimal design of the institution of intellectual property in economics is often considered as a proper balance between provision of incentives for innovations and resulting monopoly prices and deadweight losses (see e.g. Merges 2000). However, the effect on prices is not the only economic effect generated by this institution, and some argue that we must weigh the benefits of IPR "against the costs of the centralization of economic decisionmaking and the creation of barriers to innovation and market entry" (Wu, 2006). From this point of view, the most important economic effect of IPR is on industry structure and it reflects the idea that regulation, affecting the industry structure, also affects the architecture of the network. Centralization of decision making about the technological development inevitably affects the process of technological change and expresses in the architecture of the network that is, as Antonelli (1995) notices, "strongly influenced by the changing characteristics of clay technologies".

In their highly cited article of 1986 Sah and Stiglitz, analyzing the process of decision making depending on architecture of an economic system, argue that, due to the imperfectness of decision making process and limited capabilities of human minds, polyarchical systems, whose architecture is represented by "a market oriented economy", provide more opportunities to accept "good" innovations, while in hierarchies, where decision making is centralized, the risk to sort out such projects is

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[237] It leads some to the conclusion that "IP rights are rarely if ever "intellectual monopolies"." (Lemley 2009).

[238] Some even claim that "knowledge can be considered as an essential facility" (Antonelli 2007).

[239] Such position is quite common, and, for example, can be found in Scotchmer (1991).

higher. At the same time, they claim that the advantage of hierarchical systems is that they better cope with Type II errors, when it would be more reasonable to reject some accepted projects. Tim Wu (2006) emphasizes that since decentralized systems (polyarchies) are able to approve more projects then hierarchies, "they manage to capture the few available profitable ideas". Following the logic of this literature and taking into account that the technological variety of the wireless industry presented in the market is not so diverse, it is possible to argue that facilitation of decentralized decision makings in the industry would provide more chances for valuable ideas to materialize in the technological solutions.

Meanwhile, the decentralization and pluralism are highly dependent on the institutional environment that, as it was highlighted above, requires active participation of the regulator. Access to radio frequencies, essential radio technologies, infrastructure and interconnection points are those issues which efficient solution, possibly, was able to change the course of the wireless industry. What is also interesting here, is that without regulatory participation in the solution of these issues even assured access to long term financial institutions, and in the WiMAX case we observe that Intel and others have invested a lot in the project, is not sufficient for the achieving success. Moreover, inability to get access to the industrial resources merely signifies that financial support of even a lucrative idea at an early stage of its development would be highly limited, and, again it plays as a discouraging factor for innovations in the field.

Nowadays, when intellectual property rights on wireless technologies have become more concentrated, when the most interesting parts of radio spectrum have already been assigned to the mainstream, and, moreover, when they already have been propertisized by the incumbents, the entire future of the industry is totally in the hands of these proprietaries - proprietaries of technology, infrastructure and radio waves, and we do not have robust reasons to assume that such a system is able to better appreciate potential innovations than an open and competitive marketplace. As it was mentioned in the beginning of the paper, this is not the problem of market concentration that could be solved by the implementation of antitrust, but this is the problem of the exclusive rights that were granted by regulation and that finally created the barriers for the appearance of any disruptions.

5.5. Summary and conclusion for Chapter 5

The analyzed initiative to change the established wireless industry was totally defeated by the incumbents of the field. The industry has become more concentrated than it was 15 years ago, and this tendency is observed in all layers of telecommunications.

It is possible to draw some analogy of the WiMAX case with other cases of standard wars such as competition between Betamax and VHS. There were studies that claimed that Betamax was a superior standard, but, nevertheless, lost the battle, and, thus, it is possible to assume that the choice of the market did not represent the best possible outcome (Liebowitz and Margolis 1995). However, here is the crucial difference of these two cases. In the Betamax-VHS case the market played the superior role in the adoption of the technology, while in the WiMAX-LTE case the role of the market was secondary and the outcome was mainly determined by regulation. Moreover, Sony, whose videotape format was defeated by JVC, was able to bring to the market the DVD format (in collaboration with Philips, Toshiba and Panasonic) and avoid the mistakes of the previous experience. The introduction of DVD was a clear disruption for VHS industry. The DVD format provided obvious advantages for participants of the home video market and, eventually, replaced VHS as a method of video distribution. On the one hand, these two examples show us, that the market does not exclude a risk to sort out superior technology and from this point of view it is impossible to argue that it solves the problem better than regulation, but, on the other hand, it leaves more chances for a technological shift at the later stages compared to the regulatory policy that creates opportunities for leaders to determine technological development. Moreover, even if the market outcome is not the best from short-term efficiency perspectives, industrial pluralism is able to be a basis for a future technological breakthrough.

We observe more innovations in those parts of telecommunications where regulator is less active, but the core, the physical layer, of the industry is changing gradually in sustaining, not disruptive, way of development of the technology. Regulation has locked-in the future development of the industry on the mainstream technology and eliminated alternatives. Meanwhile, the WiMAX story shows us that not only that concentration in telecommunications is not a necessary condition for the innovative development, but also that disruptive technologies are able to attract investments in this field from newcomers and weak players of the industry, putting

the mainstream under the pressure of competition, and fostering innovations in their business. However, innovations require accessibility of the main resources and that might be achieved only if the resources are in the common domain. Even if WiMAX was not the technology that could benefit from this openness, it had chances to evolve to the version that could. The main advantage of the open access to the essential resources is that the openness makes easier the appearance of disruptive innovations, and regulation must facilitate this openness in order to promote the opportunities for creative destruction.

The alternative viewpoint might be that the process of technological change should be governed in public interests by public agencies because they have abilities to weigh costs and benefits of different technological regimes and choose more suitable direction for social interests. In fact, this is an alternative representation of the old discussion about virtues of "the invisible hand" and the opinion, like of Stiglitz (2001), that this hand "is simply not there", and the diversity of the theories of modern economics does not provide us any uniformity. However, even if we assume that the problem of regulatory capture is not relevant to the issue, and that the regulator is able to understand social interests and bases its actions on this understanding, we still cannot escape from the problems of epistemological limitations, transaction costs and information asymmetry, and, thus, we do not have reasons to believe that public agencies are able to govern the process of technological change better than market mechanisms.

The phenomenon of sunk costs has a deterring effect on the adoption of non-mainstream innovations by incumbents, while for potential new entrants this issue does not exist if they have not invested yet in currently presented technological solutions and they might be eager to jump into an alternative technological paradigm. However, if resources in the industry are under the total control of incumbents, then their decision about the use of such resources cannot be free from the influence of the previous investments, i.e. the presence of sunk costs heavily affects the direction of technological change if the decision making is centralized in the hands of the main players. Therefore, if regulation contributes to such centralized decision making and if the outcome of the decision making is affected by the presence of sunk costs, then this contribution shapes the entire way of technological change. Meanwhile, active participation of newcomers in innovation activity may facilitate the process of creative destruction and, thereby, result not only in positive economic

effects, but also in alleviation of socio-economic problems (see., e.g., an analysis of the impact of this process on income inequalities in Antonelli and Gehringer, 2016).

Nowadays the LTE camp analyzes the possibility to use the technology in the unlicensed radio bands and considers that technology is able to be adopted by private entities as an analogy of Wi-Fi. The same was heard in 2004 - 2010 from the disruptors of the mainstream market, but now the ideas of the disruptive innovation have been transformed into the sustaining innovation of the orthodox part of the industry. Furthermore, now the regulation moves toward such experiments, but, again, this movement supports the mainstream. It shows that regulation is able to support evolution of established technologies and adjust itself to sustaining innovations, but if leaders win in battles of sustaining innovations and entrants have opportunities to beat incumbents when disruptive innovations emerge (Christiansen 2006), then this is the regulatory regime that does not leave chances to change the landscape of the core of the industry but not the superiority of the leaders.

CHAPTER 6

Summary and Conclusion

"…the most radical and comprehensive socialist attacks on the market economy, such as that of Marx, do not undermine the market's authority as seriously as the … cynicism from inside the camp of those who are supposed to be supporting the market."

F.Böhm (1979). Left-Wing and Right Wing Approaches to the Market Economy

6.1. The ordered competition regime of the contemporary telecommunications sector

Ludwig Mises (1998) in his magnum opus "Human Action" pointed out that "there is no such thing as a mixed economy," because even if some (but not all) economic activity is directly governed by the state, we still have a case of a market economy, where enterprises are forced to adjust their performance in accordance with market principles. Following further this logic, it would be possible to argue that any economic system where "production is directed by the market" is an example of market economy. Then, any system that is based on exploitation of the masses and privileges for a few, where there is a lack of the rule of law or where the law is merely an instrument of coercion of the weak to the benefits of the powerful, any system where all property rights are assigned to cronies of the ruling elite or where widespread mechanisms of redistribution of the results of labor are adopted in order to achieve some undefined public interests are also examples of market economy if

production is not directed by "the decrees of a production tsar or a committee of production tsars." In this case, the criticism and attacks on the market economy that has been constantly observed from the left-wing side of the spectrum of the socio-economic thought are understandable and can be justified.

The problem is that a market economy in which prices, quality of goods, exploitation of resources and technological development are not determined solely by the competitive process, where wealth is not distributed in accordance with merits, but in accordance with power, and where power is concentrated in such a way that allows to dictate behavior for other market participants is not a system that can prove its superiority over the planned economy. In this case this is mainly an issue of governance — whether those who determine the production process in a planned economy or those who have captured rules of a market system are better in their skills and have access to necessary resources. Since both of these systems are very far from a free and open market, the issues of who directs production or whether the means of production are owned by the state or private entities are not in fact the determinants of superiority of any of them.

Of course, some evidence of the telecommunications industry analyzed in this monograph speaks in favor of privately owned means of production, that supports the claim of Milton Friedman that private monopoly is less evil than state monopoly (Friedman 2009). However, some other examples, on the contrary, exhibit that development of privately owned infrastructure is heavily relied on state support, that might be considered as an inability of the market to solve essential issues such as innovations and satisfaction of the existing demand.

The main claim of this research and the main conclusion derived from the analyzed telecommunications experience is that the market economy can serve general social needs only if market mechanisms work for everyone, provide opportunities for entrepreneurial discovery for a great number of small and medium sized enterprises within institutional arrangements that do not create any privileges and mitigate government imperfections that lead to concentration of economic power. Such a system obviously represents an example of market economy, but it is also as far from the existing economic order where production is directed by the market and means of production are owned by private entities as from a state controlled economic system where means of production are owned by the state. The existing economy, despite its market nature, is based on regulation of economic activity, redistribution of incomes, expropriation of commons, complex mechanisms of

privileges and state subsidization, and all this makes it totally different from the genuine competitive order where such measures simply have no sense.

The concept of competitive order is not a merely theoretical construct such as perfectly competitive markets or general equilibrium models. It hardly can be described by any mathematical equations or adopted for the welfare maximization theorems. It is based on the understanding of the market as a process of entrepreneurial discovery in the Austrian style and pays significant attention to such inherent market attributes as uncertainty, information asymmetry and subjective perception of market signals by market actors. It does not lead to the conclusion that such market imperfections have to be solved by the outside, but it does require that the state designs legal frameworks where market participants would seek solutions of any market problems through the constant trial and error process.

From the telecommunications experience it is clear that the competitive order is not only feasible in some industries that are generally perceived as opened for rivalry, but that this can be a natural state of those fields that have long been recognized as natural monopolies. Moreover, the competitive order in telecommunications shows that not only permanent intrusion into the market process in the field is unnecessary, but that there are also no needs for public subsidization of the industry development and incorporation of any "publicly desired" objectives into this domain. However, what is really necessary and where the state has to intervene is the design of clear, simple and equal rules of usage of public resources, that are crucial for the infrastructure placement, restoration of the common domain and mitigating of the government failures that are expressed in the highly concentrated markets of this area.

Nothing of this was done when the utilitarian version of liberalism promoted by the neoclassical mainstream was embraced by governments in different countries around the world and expressed in the liberalization movement where telecommunications industry was one of the first candidates to test the reforms. The liberalized paradise of the telecommunications area has been found in transformation of the monopolistic state-owned industry into a global arena for powerful players that got opportunities to extend their empires into territories where local monopolists were weak to compete with the global capital. Moreover, such expansion in some cases have been generously supported by domestic authorities that allowed local giants to extend their foreign presence, while development of their local networks has been sponsored by the public through state subsidies.

It is not surprising that the adopted policy could not evolve further without regulation, but this regulation has not been a response to any kind of market failures just because the market has had no chances to fail in this area. Market forces were suppressed already during the early days of the industry development at the end of the 19th — beginning of the 20th century, and when the liberalization campaign could finally bring a competitive order in the field, policymakers at different places of the world in unison chose to prevent its appearance. In some places they openly promoted interests of the big and powerful, in others they imitated efforts to create a competitive field trying to curb incumbents' market power, but what they have never done is attempt to force the market work through institutional arrangements where no one possesses power to exclude his rivals from the game. In other words, the new institutional arrangements that have been formed in the industry is the ordered competition regime where the state is an active participant of the industry's performance.

Chapter 2 of the monograph makes it clear that modern regulatory frameworks, despite their reasonable purposes and robust public interest justifications, are rather the consequences of the previous regulatory decisions and inability of the state to form a competitive order in the industry. However, it would be highly risky to propose in the current arrangements that the state has to retreat entirely from its participation in the industry governance. It has to solve many problems that it is trying to solve, but at the first place it has to promote opportunities for independent entrepreneurs that are competing with the giants. It would be a big mistake to liberalize the industry further and, possibly, proposals to increase the regulatory activity would be not so senseless. However, such a discussion falls into the prevailing discourse about a role of the state in the market process, while the general appeals of this study are about appropriate frameworks for this process that would allow market performance without permanent government distortions of market mechanisms. Unfortunately, recent major regulatory interventions, such as the European "roam like at home" rule, raise new barriers on the possible road toward a free economic order in telecommunications markets, and, thereby, strengthen the power of the ordered competition regime.

6.2. Answers to the research questions

The ultimate goal of the research was to check the main hypothesis of the research and provide answers to the research questions that have been expressed in Chapter 1. As it was made clear by ordoliberals, the third way is not a middle solution between market and planned economies (see, e.g., Kerber and Hartig 1999), and this is not a mixed economy that Mises (1998) rejected as an even possible construct, this is an alternative way of dealing with economic reality, where the state aims to preserve the competitive order, while the market process is left to spontaneous interactions and decisions of market participants. The reasonable question is whether such an approach is able to provide better solutions than alternatives and the first question of this research was focused on the comparison of the "ordered competition" and "competitive order" regimes.

6.2.1. "Competitive order" vs. "ordered competition"

A serious deficiency of social sciences is that researchers have no opportunity to conduct an experiment, and, thus, in order to study the field we need either to look at some models, that allegedly describe the reality and could be suitable for reasoning (and this is one of the methods that are admired by the mainstream economics), or to turn to the reality and study historical examples and base our arguments on existing facts. For the particular purpose of comparison of regimes of "ordered competition" and "competitive order" we need to have examples of both of them. While the ordered competition model of industry regulation in one or another form prevails all across the planet, there are not so many historical examples that could be considered as the alternatives. However, two of the examples that have been put in the argumentation of this research represent cases that are among the biggest markets of the world. One of them is a well-known competitive form of the early days of the telephone industry in the United States, that, however, has become the source of myths and has been generally neglected by the mainstream analysis of the natural monopoly phenomenon. The second is the recent development of the Russian telecommunications sector.

It is very clear from the US experience, discussed in Chapter 3, that the telephone industry did not represent a natural monopoly case, and that its competitive form was better suitable for achievement of social needs, which later were

incorporated in the universal service dogma, than state controlled monopolies in European countries. Paradoxically, such an obvious, interesting and prominent example has been noticeably neglected or even misinterpreted by theoretical representations of the performance of the industry in models of the neoclassical mainstream.[240] Only by the end of the century, mainstream economists finally acknowledged that competition in the industry is possible and started to change their models explaining this alteration by technological advancements. However, it is a clear contradiction between this position and the empirical example of the beginning of the 20th century where competition was defeated not through the natural market process but through explicit assistance of the state.

If the US example shows the advantages of the competitive order in the telephone industry, the Russian case exposes superiority of market-formed competition over the common European approach of regulation of the sector. The detailed case analysis of the Russian telecommunications sector, including the appearance of the competitive form of the market, evolution of the field and role of regulation in the process (that has been mainly negative), has been presented in Chapter 4. The distinctive characteristic of Russian privatization of the sector was chaotic processes that turned the industry apart and formed by the end of the 1990s competitive markets in many Russian regions. This pluralistic landscape has become the major factor of development of broadband infrastructure and expressed in the leading positions of the country in European and world ratings dedicated to the FTTx penetration. The Russian example is augmented by evidence from other Eastern European countries that show similar patterns and also "outcompete" their Western European counterparts in development of fiber networks.

The evidence that is based on the comparison of results of the competitive order cases and outcomes of the ordered competition gives a positive answer to the first research question. Indeed, this analysis provides a reasonable ground for the suggestion that the "competitive order", at least in the telecommunications field, is able to satisfy the actual needs of society better than the "ordered competition" alternative. It not only creates enough incentives and opportunities for innovations and development, it also does not require public subsidization of this activity. The market process, as it is expressed explicitly in the Austrian school, encourages entrepreneurs to look for solutions that would satisfy the existing demand.

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[240] There are even claims that the mainstream declaration "that free-market competition was the source of the telephone monopoly in the early twentieth century is the biggest lie ever told by the economics profession" (DiLorenzo 1996).

6.2.2. The political choice of the ordered competition frameworks

The break up of the Russian industry was extremely more significant than the divestiture of the former US monopoly in the 1980s, but even this limited break up of AT&T was a step toward a competitive market and clearly yielded positive outcomes. Since the United States example is often considered as a starting point for the world wide liberalization of the industry, it is interesting to note that there are only few instances when "liberalization" followed the idea of divestiture. Some countries, such as Italy or Portugal, even opted for the opposite solution. This situation relates to the second question of the research, that focused on the causes of the political choice.

If there are clear and obvious examples of advantageous of the competitive order, and if the competitive form of the industry proved its superiority even in the beginning of the telephone era, then it is necessary to understand why policy has always chosen inferior alternatives. The major part of Chapter 3 is dedicated to examination of political choices in regulatory policy of the telecommunications sector. The argumentation is constructed around two main issues: private interests that are incorporated in the political decisions and prevailing theories that are trying to provide answers about ways of achievement of the public interest.

The important conclusion of this analysis is that incorporation of private interests in the political agenda is generously backed by the mainstream theories. The telecommunications industry, where the correctly working market forces have an immense importance for the development of the sector, is very sensible for regulatory interventions that are based on the mainstream theories that do not take into account the nature of the market process. Meanwhile, the inability to grasp the reality of the market process has always been among the main criticism of neoclassical economics from the non-orthodox camp of free market supporters. Labeling telecommunications as an example of natural monopoly is one of those instances that explicitly show this deficiency of mainstream economics. Even despite the mainstream has eventually withdrawn this concept from the general description of the sector, it still looks through the same lens to some of the industry's parts.

However, it is also interesting to notice that neoclassical economics has been able eventually to develop a concept that could allow to consider the monopoly problem from the similar to the Austrian point of view — the theory of contestable

markets —,[241] but the mainstream, nevertheless, failed to properly adopt this concept to the telecommunications domain.[242] It could become a powerful argument for divestiture of former monopolies into a great number of small independent telecommunications enterprises and creation of a competitive order in the field, but the natural monopoly paradigm has been supported by other theoretical constructs for which contestable markets were not a solution. Among these constructs there are assumptions about high level of sunk costs in telecommunications business that may allegedly prevent necessary investment for the industry development or belief in the importance to avoid wasteful duplication of telecommunications facilities.

The mainstream theories have played a long and powerful role in the regulatory suppression of competitive forces and moved the industry away from a competitive order during the "liberalization" period. However, it is possible to admit that a discussion about their correctness or fallacy can be infinite and futile. There could be totally different opinions about a necessity to regulate natural monopolies and appropriate means of regulation. Moreover, some theories may have a rational basis in some particular periods of time and to be entirely groundless when technology changes a market environment. At the same time, regulation, even if we assume that it is based on theories that correctly describe our world, can never adjust itself immediately to the new reality, forming the problem of regulatory disconnection. The situation is much worse when the underlying theories of regulation are wrong, but in both cases we have to bear in mind that regulation also affects the pace and direction of technological change, and when the theories had a hostile attitude toward market competition, they influence technological development toward a high level of market concentration. This is clear that such theories are very advantageous for those who benefit from the established status quo, and one of such interesting examples has been examined in Chapter 5 that is dedicated to regulatory suppression of disruptive innovations.

The only opportunity to avoid not only problem of regulatory capture but also incorporation of theories that unintentionally hamper market mechanisms for the benefits of a few is to keep away from regulating the market process. This is an old view of classical liberalism that has not lost its value in our days and that is

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[241] Some Austrian economists reasonably claimed that this theory merely reformulation of the Austrian views that existed in economics long before its appearance. (see, e.g., Brätland 2004).

[242] Even in the 21st century some scholars has continued to argue that some parts of the industry are not contestable "due to sunk costs, high entry lags expected and a probable short price adjustment lag" (Growitsch and Wein 2002).

supported by the telecommunications industry experience that has been analyzed in the present research. However, as has been constantly mentioned above, the state should not retreat from regulation before prerequisites for the competitive order will be formed, and, thus, the main regulatory efforts should be aimed at the creation of this order. In the telecommunications sector, the biggest chance to do it was missed at the end of the last century and we have all reasons to argue that private interests was the main cause of this failure, and, what is worse, is that these interests had a tremendous support from the side of the mainstream economics.

6.2.3. Inherent characteristics of the industry

The third research question was focused at the inherent characteristics of the industry and their usage by the mainstream in its justification of interventions. As we have seen above, the mainstream justifications have always been highly beneficial for the most powerful groups of the industry and precluded formation of the competitive order. Despite it is clear for the liberal scholarship that any regulation of the market process is wrong application of government efforts, it is still interesting to understand why in those places where government failed to promote competition through regulatory tools that are based on the mainstream theories, the market was able to form a competitive environment that had much more pluralistic landscape and expressed in a significantly higher level of innovation activity.

One of the mainstream explanations of the Eastern European fiberoptic development is grounded not on the features of the market process, but on a theoretical assumption that initial conditions of the industry in the Western Europe, that had been formed by the start of the broadband development, were better than in the eastern countries. It is interesting to notice that such an explanation is quite paradoxical — the situation of today is worse because yesterday the situation was better, while the superiority of the present picture is a consequence of the fact that yesterday the conditions were worse. The problem with this position is that it perfectly explains the lack of incentives of incumbents to upgrade their networks but, taking the holistic view at the industry, ignores the fact that precisely this effect may provide incentives for innovative newcomers. Such reasoning cannot work in explanation of the market process, while it perfectly fits the understanding of the concentration of the field as a natural outcome of theoretical mainstream models. At the same time, if we comprehend a lack of innovations as a plausible consequence of

the lack of competitive order, then in order to find an explanation we have to focus on the market process.

As it was explained in Chapter 3 and Chapter 4, the argument about inferior initial conditions cannot be applied to explain the development of the Russian network. By the start of the broadband revolution in the middle of the 2000s, the Russian regions, where competitive markets were in place, already had well-developed copper infrastructure, and, therefore, the argument about lower starting conditions cannot be implemented in order to explain why FTTx architecture has outcompeted xDSL solutions. The fact that this infrastructure was not controlled by a single entity as a whole, but instead represented a great number of interconnected networks, was a major cause of independent activity of the market participants. The analysis of the case shows that the pluralistic landscape and independency have been the main prerequisites for the effective market process.

Furthermore, if the mainstream grasped the drawbacks of the holistic view on the telecommunications networks and relied on the contestable market theory, it would allow to see that small-sized telecommunications enterprises threaten each other in the neighboring territories, and, thereby, the market process forces these local monopolies to work efficiently and move their prices close to the mainstream understanding of competitive level. At the same time, the holistic view was backed by the ideas of economies of scale and high level of sunk costs. Indeed, it seems plausible that in some circumstances average costs of a big telecommunications enterprise are lower than of a small one, but it is by far not clear what are these circumstances. We might observe remarkable economies of scale if we compare a hypothetical network that has ten subscribers with a network that has ten thousand subscribers, but it is not very clear whether we will always find the presence of the phenomenon in comparison of a network that has ten thousand subscribers with a network that has ten million subscribers. The strictness of the rule about economies of scale in telecommunications has never been proven. Moreover, not only deviation in the number of subscribers does matter in the issue. The phenomenon of economies of scale in urban areas, in some circumstances, might be more remarkable, rather than in rural areas. It might be more prominent in the mobile business than in networks that provide fixed access and so on. In other words, the role of economies of scale might be significant in the industry, but whether it does depends on many factors. However, what is more important, the advantages of economies of scale of a company can be countervailed by the growth of internal transaction costs and by the loss of

flexibility of the business. Small enterprises can be more flexible in their response to the changing market environment, but they need to have access to the vital resources of the industry.

Of course, it is necessary to acknowledge that the mainstream understood limitations of the economies of scale paradigm in the telecommunications sector, but, nevertheless, it did never propose a full-scale separation of state-owned enterprises before the liberalization, and the economies of scale concept was not the last factor in this outlook. Another major predicament of the mainstream theories has been the view that telecommunications infrastructure requires high level of sunk costs, and, thus, a big company have more opportunities to cope with this issue.

The actual market process shows quite the opposite examples that dismiss both — the economies of scale that tilt the industry towards concentration and high level of sunk costs that requires a big size of an enterprise — paradigms. Chapter 4 and Chapter 5 expose the Russian case and the WiMax case, and these cases reveal many instances of activity of small and medium sized enterprises that brought innovations into the market. FTTB networks in Russia and wireless broadband access networks were technological solutions that were initially considered by independent enterprises as possible instruments in a battle with giants, and only after they appeared in the market and started to threaten the established status quo, the mainstream part of the industry had been forced to change its business practices.

Moreover, the telecommunications example shows that the mainstream assessment of costs of technological solutions do not always reflect the truth. Even now in the mainstream literature we can meet the view about high costs of FTTB networks, while the analysis of actual market circumstances shows quite the opposite. The permanent search of more efficient ways to satisfy human needs is precisely the main characteristic of the market process, that has been always emphasized by the Austrian school. That is why inexpensive and efficient solutions of construction of fiberoptic networks have been proliferated in those territories where market mechanisms really worked, and vice versa — where they have been suppressed, these solutions remain expensive and unprofitable even now, and, as a result, demand for public subsidization.

The ultimate answer to the question about reliance of the mainstream explanations on the inherent characteristics of the industry is that they cannot justify the interventions in the market process if there are institutional arrangements that facilitate the governance of the field by market forces. Moreover, these characteristics

can play in favor of competition, and, therefore, the ordered competition regime merely hinders such opportunities.

6.2.4. Prerequisites of the competitive order

Despite the results of this research explicitly support the free market idea of the classical liberalism with minimal state participation in our economy, there is an important task to constantly emphasize the position that the absolute and immediate retreat of the government from any regulatory activity can hardly be justified. The market can make things worse if institutional arrangements are not favorable for the genuine competitive order, and this is exactly what have been expressed in the drawbacks of the liberalization movement. It is quite risky to rely on self-correcting power of the market, because this idea about self-correctness per se is a result of theoretical endeavors that are not supported by robust empirical evidence. Moreover, even if it holds true, this is absolutely unclear what time is required for the market to put everything on proper places, and, thus, we have no reasons at all to assume that this process may be sustainable and would not be turned backward by unsatisfactory results of the intermediate stages. The growing presence of government in "liberalized" industries is also an example that shows unsustainability of the free market paradigm within institutional frameworks that do not provide a robust support for effective work of market mechanisms.

The question about appropriate prerequisites of the competitive order has to be put in the agenda of a free society before the government can be excluded from the governance of the market process. However, it also does not signify that some spheres cannot and must not be freed from any kinds of interventions completely and immediately. The hesitations would merely allow the dominant players to adopt their business practices to the new liberalized environment, and this is also the problem that has been raised in this research. Instead of putting all telecommunications services at once in competitive conditions and removing the barriers for potential entrants, regulation gave the incumbents necessary time to adjust their activity and to prepare for the future competitive entry. Instead of opening the radio spectrum for use of any potential technology, regulation introduced the technology neutrality principle only when the victory of the mainstream technology started to materialize in wireless markets.

The competitive order requires that all privileges, all interventions in the fields of commons were ceased at once, and the sooner it happens, the more chances we will have for success of the market economy. The negative attitude toward privileges has always been an important part of the classical liberalism, and telecommunications experience shows that they cannot be justified by the public interest perspective. The privileged use of public infrastructure for cable placement, the privileged use of the rights of way, the privileged use of radio frequencies are precisely those factors that shaped the mainstream understanding of unavoidability (and sometimes even a necessity) of concentration of telecommunications networks. Of course, there are obvious reasons that would not allow to withdraw the privileges immediately. In some instances we may face a private property argument, in others the arguments about technological limitations. However, this situation simply signifies that such arguments have to be taken into account and have to be solved by government interventions, and these interventions are by no means interventions in free market mechanisms — they are interventions in the governmental allocation of property rights and privileges that have an aim to provide remedies for imperfections of the regulatory formed environment. Moreover, the tasks for the state would exist even in the competitive order regime, and the main duty is to prevent abuse of a common resource and to maintain frameworks that would preserve its availability.

Meanwhile, if theoretical limitations of radio spectrum or public infrastructure may raise the "tragedy of commons" arguments, some of the resources that have been expropriated from the commons do not share such characteristics. The mainstream has invented a paradigm according to which the market is unable to provide sufficient incentives for entrepreneurial activity. The result of these efforts is widely adopted institutions that have entered the fields of intangible goods, and this is precisely the extension of the property domain that has been criticized by the liberal scholarship in the middle of the 20s century.

This is not a surprising that many modern libertarians are among the fiercest opponents of intellectual property[243] because this institution is inconsistent with morality of the liberal philosophy (see, e.g., Rothbard 2009; Kinsella 2001; Palmer 1990; Shaffer 2014). The mid-20th century classical liberals such as Hayek or Eucken, whose views have been discussed in the Introduction, did not have such a radical attitude, but, nevertheless, were very suspicious towards implementation of the

[243] However, such domains as copyright or trade marks are not always the objects of the attacks, but the generic term intellectual property is used here because of the ambiguity of the new ways and methods of protection of intellectual goods.

intellectual property approach and criticized this institution. The main justification of intellectual property that has been broadly used by the mainstream and the main cause why classical liberals did not entirely share the modern libertarian attitude toward this phenomenon are the utilitarian beliefs that are based on the mainstream theoretical models and that have been taken for granted by the vast majority of academic society.

Meanwhile, since the middle of the 20th century this institution has increased its power and has expanded its influence on a large number of new territories that nowadays not only libertarians but many academics from different fields have started to raise their objections. Of course, the discussion about possible optimal design of this institution is totally understandable. Indeed, it might be supported by arguments from both — natural law and utilitarian — areas and in both directions (Lemley 2015), but this discussion could be infinite and will never lead to alleviation of such an unjust and unreasonable form of the rules that we have today and that have become a common object for criticism. While it is possible to admit that its total abolishment is not the most efficient solution, it seems apparent that this is one of the best available alternatives simply because it potentially can bring alleviation of the inequality problem and the necessity to disperse the economic power, while the search of the optimum will never give positive results due to existence of powerful interests in the policy making process.

Chapter 5 provides additional utilitarian arguments in favor of the openness of the sphere of intangible resources and argue that concentration of the manufacturing market is interconnected with highly concentrated markets of telecommunications services, and that restoration of the domain of commons is crucial for pluralization of the sector. However, the problem is much deeper. It is possible to argue, that while small and medium size enterprises may, indeed, be active and successful in broadband or fixed telephony markets, this is not the case of modern cellular networks. But this is a problem of the network architecture, and this architecture, in turn, is a product of those who have concentrated in their hands rights to affect the technology development. Meanwhile, the government intervention in the fields of ideas has allowed them to concentrate these rights and to dictate the technological change for the industry. This is a clear example of interdependence of orders in the ordoliberal sense, where intrusion in one of the fields generates unpleasant consequences in others. As a result, the conclusion of Chapter 5 is rather the opposite to the widely accepted view about a necessity of such an intrusion to spur innovations, but, at the

same time, it supports the growing literature that is trying to prove that the impact is negative. And again, while the unrealistic mainstream models are unable to grasp the utilitarian uselessness of intellectual property, the understanding of the market process in accordance with the Austrian outlook rather leaves little place for interventions in the field of ideas.[244]

The measures described above are necessary but by far not sufficient for establishment of the competitive order. The very important undertaking that has to be done is elimination of the concentrated economic power, and an unavoidable measure for achievement of this goal is the full-scale divestiture of the giants. Only after that the interventions can be removed from the industry and transformed to a form of competition policy. The two major examples that have been described in this study — one in the form of references in Chapter 3 and another as a detailed analysis in Chapter 4 — clearly show that a competitive form is a form with many enterprises in the field that have an opportunity to act independently from major players.

Of course, strictly speaking, both these cases — North American and Russian — are not examples of the competitive order in a form that could be considered an ideal of the free market economy. In the United States, the existence of such intervention in market mechanisms as institution of intellectual property has created substantial competitive advantages for American Telephone and Telegraph Company that eventually allowed the genius of Theodor Vail to influence the interaction of the market and political process and turn the competitive sector into monopoly. The Russian industry has had the same problem, namely the presence of concentrated market power that has provided enormous opportunities to affect the political decisions. As a result, in both of these circumstances the competitive order was not sustainable, and this is precisely the issue that was raised by ordoliberals and later in a slightly different form by new institutional economics (see, e.g., Zweynert 2015).

In summary, the prerequisites of the competitive order in the telecommunications industry are based on several simple principles: 1) formation of an institutional environment where public infrastructure and common resources, such as the radio spectrum, are equally accessible to everyone and the role of regulation is to maintain this accessibility and prevent abuse of the usage of the resources; 2) restoration of the common domain through reassessment of the intellectual property regime and reconsideration of the areas where this institution is really appropriate. In

[244] For the Austrian view at the institution of intellectual property see, e.g. Kinsella (2001), Rothbard (2009). However, it is also necessary to notice that the Austrian outlook has not been uniform in its perception of IPR (Cwik 2008).

the same way as Hayek warned about 70 years ago, nowadays, when the new economy has dramatically moved the horizons of concentration of economic power and when the role of the growing territory of intellectual property in this concentration is more than apparent, we must seriously reexamine "whether the award of a monopoly privilege is really the most appropriate and effective form of reward for the kind of risk-bearing which investment in scientific research involves" (Hayek 1949b); 3) elimination of economic power through the full-scale divestiture of the main industry players.

6.3. The competitive order for the new economy

The lessons of telecommunications may be useful for the new economy not only because its industries share many similar characteristics with telecommunications networks, and not only because the telecommunications sector is a crucial infrastructural part of the new economy; orders of all parts of the new economy are intertwined with telecommunications in not less sensible way than the order of telecommunications markets is intertwined with the order of the manufacturing sector that supply its solutions for telecommunications. The current debates about network neutrality reveal the place of interconnection of the brick and mortal world and online reality. Indeed, implementation of the principle of network neutrality has a great importance in current circumstances and it is easy to admit that its rejection can have a very negative consequences for the future of the online industries as well as for many telecommunications enterprises. However, the problem is not that the "wealth of networks" cannot be preserved without reliance on such principles, they have sense only because the order of telecommunications markets and order of major online sectors are not competitive. Otherwise, any necessity to regulate "equality of all bits" would be totally irrelevant to the needs of customers and business enterprises.

The industries of the new economy have exactly the same core of their problems as telecommunications markets: they are highly concentrated and this concentration is by no means a result of mechanisms of the free market. However, it is important to acknowledge that this fact is not on the surface because we perceive some regulatory actions as something inherent and intrinsic for our environment. It might be even noticed that a "market looks free only because we so unconditionally accept its

underlying restrictions that we fail to see them" (Chang 2010). Even those markets that appear free from government interventions are, in fact, affected by regulation of other fields or by rules that are not so apparent due to their intrinsic nature.

Moreover, we should not neglect the fact that even the Internet, the backbone of the new economy, is a result of government activity and not a fruit of a free market system. ARPANET, the first step toward the global system of the Internet, was a project initially founded and funded by the US Department of Defense, and the following stages of the system were also not without active government participation. Of course, we can admit that the laissez-faire economy could also create something similar, but it is risky to suppose that the result would be the same. Would such kind of laissez-faire developed Internet use similar ideas and a similar set of technologies on different layers of the system and would such system be based on the same layer model? Would the system use the same protocols, services and provide the same level of interoperability? Would the same or similar principles, norms and procedures be incorporated in the system of governance of the field? In this sense, it is important to notice that there is an opinion that "packet switching … could have been implemented in a variety of ways" (Greenstein 2016), and, thus, even despite the complex, multi-actor nature of the Internet, it is still possible to suppose that without government participation in the process, the market could choose some other alternatives. We have no opportunity to conduct an experiment in order to find answers to such questions, but it is reasonable to assume that the answers are negative. If this system existed, it could represent something different, and we cannot even imagine how it could affect the landscape of industries of the new economy, distribution of wealth and which kind of problems of privacy or security we would face.

There are many areas that has influenced the concentration of the new economy. There is a sphere of intellectual goods that fuels the business of Amazon.com, has secured positions of Microsoft and Apple, and has ascended to the summit Qualcomm. Of course, it is necessary to admit that some spheres of the new economy are driven by data, and some of the leaders, like Google or Facebook, could possibly have achieved their world dominance even in the absence of intellectual property rights,[245] but we also have to take into account, that intellectual property does play a role in these business undertakings. The extension of the business of Google in new

[245] However, it is interesting to notice that until relatively recently, despite the more than obvious advantage in having the data, Google was not the leader on the market of search engines everywhere in the world. For example, in the market of Russia the leader was Yandex, Seznam.cz was the leader of the market in Czech Republic, and there are also examples of China and Japan.

fields has been backed by extension of the patent portfolio of the company. The company clearly demonstrated the value for its endeavors of intellectual property when it offered USD 900 millions for Nortel patents (*ITU News,* September 2011) or when it acquired Motorola Mobility for USD 12.5 billion and then sold it to Lenovo for USD 2.91 billion, keeping the patent portfolio for itself (*CNet*, 2014, October 30). Even if these actions could be seen as defensive in the ongoing patent battles around mobile standards, we have to admit that without the existence of government distortions of mechanisms of the free market in the realm of intangible goods we would, possibly, have another set of the standards, another landscape of the industry, other players and business practices.

Another important issue that does not allow to consider the new economy as an outcome of a laissez-faire system is the sources of investments in this sphere. In some cases we merely have a deal with direct government interventions through various forms of subsidization of innovations in the field, and it differs significantly from what we usually understand as a free market. Silicon Valley from the very beginning has had a close collaboration with the US government that has provided financial support for different high-tech projects of this area, and it affected the entire ecosystem of the region. Moreover, the US government has created a favorable environment for the venture capital industry through the reduction of the capital gain tax rate and relaxation of "prudent man rule" restriction, that earlier did not allow pension funds to invest in high-risk assets. The latter made pension funds a significant source of venture capital in the US by the late 1980s (Kenney and Florida 2000; Rao and Scaruffi 2013), and created legal protection for risky investments of the regulated financial institutions (Lucas 2012). According to some opinions, this irresponsible policy had led to financial crisis of 2008, and if it holds true, then the major US business have been indirectly sponsored without any compensation by citizens from all over the world. The modern version of capitalism has allowed giants of the new economy to "ride the wave" of immense state investments, while the public was bearing the risks in the innovation process (Mazzucato 2015).

There are also important spheres that are determined by diversity of national regulatory systems and international institutions, and the problem arises not only due to the extractive institutions of some countries, but might also be a result of government interventions to cope with alleged market failures in some particular jurisdictions when other jurisdictions do not take them into account. Leenes (2015), for example, notices that the obligation of European providers to inform users about

cookies put them at a disadvantage versus providers from outside of Europe. Some even have tried to measure the losses from enacted legislation on privacy and data protection in different parts of the world (Bauer et al. 2014).

This list can be infinite, but the main conclusion form such arrangements is that the real nature of the new economy is the regulatory formed nature, and the highly concentrated form of modern markets is not a consequence of market imperfections, but the direct result of distortions of market mechanisms. It is totally unclear whether the state is able to arrange an honest distribution of the fruits of its entrepreneurial activity (Mazzucato 2015), or to maintain "innovation from the edges" (see Greenstein 2016) when the vital resources of the economic system is under control of the most powerful corporations of the world that have enough opportunities to affect the work of the state mechanisms. At the same time, it is apparent that the negative outcomes of the modern days are the results of the state activity, but not of some kind of a free market system. Therefore, in order to revive the genuine market process, the government has to provide remedies for its interventions, and formation of a competitive order in vital spheres of the new economy could be a possible alternative to the regulatory capitalism. The lessons of the telecommunications experience provide the recipe that might be applicable to other spheres: accessibility of crucial resources, reconsideration of the boundaries of the common domain and elimination of the market power.

Nowadays, when the regulatory machine is increasing its pace, leaving more and more people in worse conditions that they had before, there are urgent needs to do something. It is quite possible that the final destination of this road is that that was forecasted by Hayek in 1944. Moreover, the growing power of the new economy and the state support of the established status quo make this forecast closer and closer to the reality, and if we do not want to arrive to "the serfdom" we have to make radical changes in the state-economy relationship. We have no reasons to believe that government will ever change the situation in the existing frameworks, and, thus, the frameworks have to be changed. The existing democratic institutions, despite of all their weakness and imperfections, still can serve the general public needs and promote the new frameworks for which de-concentration and decentralization have to become major aims. And then, the proposed measures of this research will have a chance to replace the unjust and devastating principles of the modern economic policy.

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