

# IS UNIVERSAL SERVICE JUSTIFIED BY THE PUBLIC INTEREST? FROM THE EARLY DAYS TO THE DIGITAL AGE

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## Abstract

*It is commonly accepted that universal service is clearly justified by reference to the public interest, and this understanding stems from the natural monopoly paradigm. However, telecommunications monopolies have never been 'natural', and the alternative to regulation has always been a competitive marketplace. The liberalisation movement had a chance to create a genuinely competitive industry but failed to do so. This article argues that the universal service dogma has played a significant role in the formation of the ordered competition regime of modern telecommunications, and explains this phenomenon in terms of public choice theory.*

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**Keywords:** digital divide; public choice; public interest; telecommunications; universal service.

## 1. Introduction

The modern understanding of universal service is service everywhere for everyone and for an affordable price.<sup>1</sup> It is commonly accepted that universal service is clearly justified by reference to the public interest because it solves important issues of equity, social justice, inclusiveness and so on (Bourguignon and Ferrando 2007), and because the market is allegedly unable to solve these problems: that is, there is a problem of market failure (see e.g. Cremer et al. 2001). The mainstream understanding of the issue takes these propositions for granted; but there are sound arguments that challenge them.

First of all, it is unclear whether the public interest, even if it is supported by ideas of social justice and suchlike, really requires distortion of market mechanisms and provision of services through the coercion of market actors (see e.g. Compaine 2001). Second, the claim that the market is unable to solve these social issues more efficiently than government has arguably been adopted without robust evidence of market failure (see e.g. Alleman et al. 2010). Moreover, the historical circumstances that gave birth to the notion of universal service contradict the modern understanding, and explicitly show that the market was better able to expand the network and provide affordable services (Mueller 2013).

While market failure justifications of universal service have, as a rule, been based on the mainstream paradigm of natural monopoly, the empirical facts suggest that the claim 'that free-market competition was the source of the telephone monopoly in the early twentieth century is

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the biggest lie ever told by the economics profession' (DiLorenzo 1996, p. 57). The bitter truth is that the telecommunications industry has never been left to the power of market forces. These forces were suppressed during the early days of the industry's development at the end of the nineteenth century and the beginning of the twentieth; and when the liberalisation campaign had the opportunity to introduce a genuine competitive order in the field, policymakers in different countries chose to prevent it.<sup>2</sup> The industry's new institutional arrangements amount to an 'ordered' or 'managed' competition regime where the state is an active participant (Burton 1997; Lehman and Weisman 2000; Hancher and Larouche 2013).

Therefore, there are no reasons to blame the market for its alleged inability to meet actual social needs efficiently. Since these needs have been expressed in public policy in terms of universal service, the development of this concept should be examined and its public interest rationale questioned. Crucially, we need to know whether this public interest justification is in fact just a cover for the private interests of the most powerful industry actors, in the way assumed by private interest theories of regulation (see e.g. Stigler 1971; Buchanan and Tullock 1962). The purpose of this article is to examine weaknesses of public interest justifications of the concept of universal service and to test whether the concept has been used by industry leaders in order to obtain public subsidies for their business undertakings and to protect the status quo from the competition that genuine market processes could introduce.

The article begins with a brief excursus on the early days of the industry, when the idea of universal service was born. We then analyse the cross-subsidisation principle that has become the major obstacle to the development of competition in the industry. The article next examines the legacy of government interventions in the telecommunications field that has allowed the reincarnation of the universal service dogma in the information age and its augmentation with the concept of a digital divide. Our analysis of this research is undertaken through the lens of public choice theory, to which the final sections are dedicated.

## 2. The lessons from the early days

Mueller (2013), in debunking 'the prevailing mythology', argues that the universal service concept as it is understood today was not, and could not have been, used in the policy discourse that preceded the consolidation of the US telecommunications industry. After 14 years of the monopoly of the Bell System, 'alternative companies' entered the market of telephone services, and, by 1907, they had jointly taken more than a half of the market share. Their appearance spurred the development of the industry, reduced rates, extended the network into rural areas and resulted in a level of penetration of telephone services in the first two decades of the twentieth century that telecom monopolies in many European countries had not been able to achieve by the 1970s or 1980s.<sup>3</sup> However, the network did not have a homogenous structure and many territories experienced 'dual service' competition, where two parallel telephone systems competed without interconnection, and expansion was a necessary endeavour for the competitors because such a strategy allowed them to increase the value of their networks, and thereby to obtain a competitive advantage.<sup>4</sup>

For the business interests of the former monopolist – American Telephone and Telegraph Company (AT&T), the head of the Bell System – such competition was fairly destructive

because it forced the company not only to reduce rates but also to invest in network development, to innovate, to become more efficient and to share the market surplus with its competitors. The problem was aggravated by the substantial diseconomies of scale of the telephone business: the growing number of subscribers increased the average cost, which, since rates were under competitive pressure, lowered profitability.<sup>5</sup> This phenomenon, which Mueller (1989) identifies as ‘the switchboard problem’, is mainly explained by technological features of the early telephone exchanges. The consolidation of the network in the hands of a single company would solve all of these problems at once, and eventual monopolisation in fact resulted in a significant increase in rates (Janson and Yoo 2013; Mueller 2013), a slowdown in network development (Mueller 2013), and elimination of the necessity to share profits with independent rivals.

The monopolistic structure of the US industry was an outcome not of market forces but of a deliberate government policy to encourage consolidation through various mechanisms and to relax antitrust regulation (Janson and Yoo 2013; DiLorenzo 1996; Thierer 1994; Faulhaber 2003). The policy therefore needed to be justified in terms of the public interest. The universal service concept, promoted by Theodore Vail, president of AT&T at the time, provided the basis for this justification. 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. There was also a strong belief that a regulated monopoly would work more efficiently than an unregulated marketplace and avoid ‘the economic loss occasioned by duplication of plant and force’;<sup>6</sup> thus, rates set by government would be fairer and would better meet 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 the decision promote: those of the ‘public’ or those of the owners of the ‘corporation’? Arguably, this is a case where the public interest coincided with the interests of the corporation, but it can be argued that a monopoly always results in deadweight loss for the society and monopoly profits for the owners of the monopoly.<sup>7</sup> Unfortunately, it is impossible to conduct an experiment and to see what kind of network and what level of technology development could be achieved if the policy reflected other views of the public interest, such as the necessity for strong antitrust regulation or a return to an economy dominated by small enterprises (see e.g. Brandeis 1914); but another policy would have also inevitably resulted in alternative patterns of wealth distribution and performance of the entire economy. The important lesson from the early days of the industry is that the market performed better than the government in promoting innovations, developing networks in rural areas<sup>8</sup> and establishing affordable prices, while the role of the government was still very important in preserving a competitive landscape of the market. Moreover, even universal service objectives as an alternative to dual service competition could be achieved by promoting interconnection rather than consolidation.<sup>9</sup>

### **3. Separation of services and cross-subsidisation**

The public interest regulation of rates has always rested on the idea of moving monopolistic prices closer to the competitive level in order to reduce the deadweight loss from the concentrated structure

of the industry; that is, to provide remedies for market failure as generally understood. However, likewise from the public interest standpoint, an alternative response is to alter the market structure and to foster rivalry in the field.

The telecommunications industry throughout the world was perceived as a natural monopoly for most of the twentieth century, and, thus, the alternative 'regulation by the market' approach was deemed either unfeasible or unreasonable. However, it is easy to infer from the etymology of the term 'natural monopoly' that some industries tend to be highly concentrated as a natural outcome of market forces. This means that the entire production of markets that have natural monopoly characteristics can be concentrated under the control of single producers without any regulatory protection for such monopolies and prohibition on other would-be market entrants. Obviously, that was not the case with telecommunications, where states prohibited competition and protected the monopolistic structure of the industry from external threats, including markets for substitutes (see e.g. DiLorenzo 1996; Thierer 1994).<sup>10</sup>

One of the main justifications for such policy was based on the formula of cross-subsidisation of the services, which according to Mueller (2013) led to the modern understanding of the 'universal service' concept. It is usually assumed that the cost of service provision in highly dense urban areas is lower than the cost of network operation in rural zones, and, therefore, the high profits obtained from the services in cities might subsidise the 'unprofitable' business in villages and sparsely inhabited areas. Another direction of cross-subsidisation is between different groups of subscribers, namely businesses and households, and that led to the assumption that not only might their rates differ, but the services used mainly by businesses should be more profitable for a monopoly than the services used by households. From this point of view, long-distance phone services should be more profitable than local services.

The introduction of competition in the telecommunications markets has raised the question of cross-subsidisation from the services provided by newcomers.<sup>11</sup> Newcomers supposedly enter only commercially interesting territories, while the burden of service provision elsewhere rests entirely on the shoulders of incumbents; and since this latter part of the business is understood to be an unprofitable endeavour based on the social obligations of a regulated monopoly, the new entrants have to compensate for it and share the social obligations through universal service funds.

In other words, universal service as understood today is a principle according to which some users of the network pay for the services that are consumed by other users; when this mechanism works within a single organisation it might be governed by price regulation, but when the marketplace is opened to more than one service provider it raises the question of the competitive advantages of those providers whose prices are not regulated. Conversely, if universal service provision envisages redistribution of some of the revenues of some service providers to their rivals, a competitive advantage can be acquired by the more powerful actors.<sup>12</sup> Regardless of the chosen methods of achieving universal service objectives, we have a case where market mechanisms are suppressed; and the problem is not only that some individuals are forced to pay for others, but that reliance on cross-subsidies leads the market away from a potentially competitive place (Spulber and Yoo 2008). Mueller (2013, p. 172), for example, points out 'an unresolved contradiction between the policy goal of promoting competition and the methods of universal service support'. Meanwhile, not only has the universal service dogma survived during the technological change in the industry in recent decades, which had the potential to turn the former monopolistic marketplace into a competitive one, but the concept has been reinforced by a new vision of the need for information resources to be accessible and affordable by the wider society.

#### 4. The rise of the 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 emphasise the role of information in the new social and economic order have augmented the universal service concept with 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 access has been widely perceived as a market failure. Since market failure is a long-standing justification for government interventions in the economy, and since inequality of access to the vital resources is generally considered to be morally unacceptable, the idea of a digital divide between those with access to global information networks and those without has been embraced by governments and even international institutions almost everywhere in the world.

Moreover, the idea that ubiquitous broadband access is essential for the health of the economy has been taken for granted not only by politicians but also by a significant proportion of academia. Since the transition towards the new economy began, many researchers have forcefully stressed the vital role of telecommunications. The claims that ‘the diffusion of broadband infrastructure and services provides substantial economic benefits and represents an important driver of economic growth’ (Gruber et al. 2014, p. 1047) have been supported by a number of empirical studies, and have become common arguments in favour of government subsidisation and other interventions. Some scholars have found causal links among the development of telecommunications, economic growth and ‘key indicators of operation of a modern economy’ (Pradhan et al. 2014, p. 634). Others have discovered a positive causal relationship between telecommunications infrastructure and economic performance (Röller and Waverman 2001). Some scholars even have argued that ‘real GDP’ represents ‘a function of labour force, capital stock and broadband and fixed line infrastructure’ (Gruber et al. 2014, p. 1052).

This understanding of the public interest has resulted in a number of attempts by governments in different parts of the world to promote the development of broadband telecommunications networks and to solve the problem of the digital divide. In 2009, the US Federal Communications Commission (FCC), fulfilling Congress’s mandate, started the process of creating a national broadband plan ‘ensuring that every American has “access to broadband capability”’ (FCC 2010, p. 3). This plan has been praised as a roadmap for the industry’s development and was promoted by the Obama administration. The plan clearly overlaps 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 embraced an additional component – ‘digital literacy’ – and appealed for state interventions in order to ensure that ‘every American has the opportunity to become digitally literate’ (FCC 2010, p. xiii).

On the other side of the Atlantic, the European Commission launched ‘The Europe 2020 Strategy’, one of whose main ‘flagship initiatives’ is ‘The Digital Agenda for Europe’. Among the objectives of the digital agenda are the 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 the ‘digital divide’, encouragement of the next generation networks development, and so on and so forth (European Commission 2010).

Both the US and the EU strategies envisage particular characteristics of broadband that have to be achieved in their territories. The ‘goal no. 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’ (FCC 2010, p. 9), 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' (European Commission 2012). And this aim, as well as the requirements of 'digital literacy', make the digital divide concept different from both the previous approaches to universal service: the past approach, which was aimed at consolidation and uniformity, and the modern approach, which is aimed at affordability and ubiquity.

From such a perspective, which justifies intervention by reference to market imperfection, it might be inferred that governments see market failures on both sides of the telecommunications market, that is, the market is not able to generate the necessary demand, and, simultaneously, the market is unable to satisfy demand without government intervention (see e.g. Gruber et al. 2014). In other words, there is a widely accepted view of how the public interest requires the industry to be structured, and the inability of the market to achieve this structure constitutes the modern version of its market failure.

## 5. The weakness of the public interest view of universal service and digital divide

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

From the lessons of the early days of the industry, it is clear that the market was more suitable for the promotion of industry development, reduction of rates, and expansion of the network into rural areas, and so the modern justification of universal service goals in market failure terms seems questionable. The existence in developed countries at the beginning of the twenty-first century of large populated areas where supply of telephone services was insufficient, or where the prices for such services were unaffordable for a significant part of population, is rather the consequence of the monopolistic state-run industry of the twentieth century than of market imperfections. Of course, it does not signify that the problems should not be solved, but it means that the alternative to state intervention aimed at universal service provision could be the restoration of market mechanisms in the industry and full liberalisation of the field.

The belief that the industry is unable to cross-subsidise services and that without regulation prices will become unaffordable for some social groups has been contradicted by the empirical evidence of the early days. On the contrary, the problem of cost separation in telecommunications has always existed because different services use the same elements of the networks (Mueller 2013). 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 could be found in the relaxation of regulation of particular parts of the radio spectrum in such territories. The same might be said not only of telephone services but also of access to information services.

It is also very important to keep in mind that over the twentieth century universal service very often meant 'universally poor service', while the introduction of competition in the industry has 'done more to achieve the objectives of universal service' (Stiglitz 1999, p. 26); and this situation per se questions the 'public interestedness' of this concept which, at the same time, was one of the main justifications for the monopolistic nature of the field. It is interesting to note that public interest justifications of the universal service idea are challenged by cases in other network industries and vital segments of public utilities – water supply, electricity, sanitation – where the market has been able to provide better solutions than policy justified in public interest terms (see e.g. Ehrhardt and Burdon 1999).



The need for government assistance in broadband provision as an essential tool of economic growth, especially in the forms of stimulating broadband demand and subsidising supply, might also be challenged by simple reasoning. At the end of the first decade of the twenty-first century it became apparent that high broadband penetration level and affordability of services in rural areas, which in fact already were in place in many developed countries, do not provide any protection for the economy and do not guarantee economic growth. The negative GDP growth rate of the Eurozone in 2012 and 2013, when broadband penetration had become even higher and already augmented by the appearance of the advanced wireless broadband, openly throws doubt on positive correlations between broadband provision and economic development. Of course, other factors also influence economic performance, and these might be blamed for the economic stagnation, but it is precisely the existence of other factors that is ignored by theories which claim that the economic growth is ‘a function of labor force, capital stock and broadband and fixed line infrastructure’ (Gruber et al. 2014, p. 1052) and which have been incorporated in public policy. The advertisement of the Digital Agenda for Europe claiming that ‘[t]he Internet economy creates 5 jobs for every 2 “offline” jobs lost’ (European Commission 2014, p. 4) vividly contradicts the reality if we look at the EU unemployment rates in 2012–14, and clearly exposes the populism of European policymakers, which can hardly be justified by a genuine public interest stance, even if the proclaimed objectives seem public spirited.

Moreover, in addition to the questionable correlation between telecommunications development and economic growth, a link can be found between the expansion of networks and the growth of income inequality; and this link, unlike the connection between the development of telecommunications and economic performance, did not break in 2008, and has become even more explicit.<sup>13</sup> The more developed telecommunications networks are, and the more affordable services to different strata of society and in different territories become, the higher the level of inequality becomes and the richer the richest persons of the world are. It is very important to stress that this is not a claim about a causal relationship between these variables; on the contrary, it is quite probable that the growth of networks might reduce inequality. But at the same time it is possible to argue that this depends on the regulatory regime which governs the field.

Since the telecommunications industry is among the major driving forces of the new economy, the question could indeed be posed about the role of telecommunications development in the unequal distribution of wealth. However, it seems more appropriate to query the impact of government interventions that have shaped the trajectory and the pace of the evolution of the industry on the eventual distribution of economic benefits from modern networks. And here the problem might be interpreted in terms not of too much or too little regulation, but of the appropriateness of the established goals and measures of their realisation.

A real, open and competitive market in the industry could be an alternative to the existing ways of achieving socially desirable objectives, but that does not mean 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 an oligopolistic field through attempts to promote artificial competition where such competition would be impossible in the real marketplace. In other words, to use the terminology of Hayek (1949), 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 (see also Burton 1997; Littlechild 2018). Of course, the ability to implement such a solution is limited by political mechanisms and existing institutions, but that does not mean that economics has never provided recipes on how the market can really serve social needs. The problem is that these

proposals have never been adopted, and public choice theory explains why policymakers have always chosen inferior alternatives.

## 6. The public choice perspective of the universal service and digital divide issue

Public choice scholarship has already paid attention to the notion of universal service. For example, Brady (2002, p. 103), analysing 'political and institutional forces that limit deregulation', points out that the new regulatory regime had preserved 'a host of special "universal service" subsidies for favored groups'. In general, among these favoured groups are not only companies that get subsidies for developing their networks but also 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. 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 to create or preserve such a system may be regarded positively by particular groups of voters. Since in the monopolistic telephone industry the cross-subsidy often took a form of higher rates for long-service calls, which were mainly consumed by business customers, and lower rates for households, 'households voted for business to transfer income to them through lower phone rates' (Brady 2002, p. 110).

Deregulation of the industry revealed that such systems of cross-subsidisation are one of the major impediments to the creation of a competitive market (see e.g. Spulber and Yoo 2008; Mueller 2013), but under the new institutional arrangements the problem has been reformulated from a system of income redistribution to a system where some market participants have an opportunity to gain a competitive advantage over others in one form or another. On the one hand, it might be an advantage to newcomers whose prices are not regulated, but on the other hand it might be an advantage to incumbents if regulation forces newcomers to contribute to services provision by the established market leaders. A significant number of countries have chosen the option where some industry players are forced to pay for developing the networks of their rivals,<sup>14</sup> but it should be noted that this is not a uniform 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<sup>15</sup> rather than from mandatory contributions from market players; but this approach does not eliminate the problem of regulatory capture and abuse of public resources by private business interests. And again, from the perspective of public choice theory, these various policies might be explained by the different lobbying opportunities interest groups have in different countries, by different levels of corruption and by different social attitudes to the role of government in the economy and to the role of small independent entrepreneurs.

The view promoted by social scientists and politicians, namely that the growing industries of the new economy require government support and that this support will have positive consequences for all, could hardly be rejected by the public simply because almost everyone could see personal benefits flowing from it. The numerous plans and agendas have always been supported by arguments about the need to tackle the problems of the poor and people with disabilities, and in modern Western society such arguments are treated as morally compelling. The augmentation of the policy with proposals for the 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 has been welcomed by those who consider themselves members of that information society even though the disadvantaged groups have not demanded it.



As a result, many politicians regard it as essential for their careers to take advantage of the accepted view of the role of new technologies and, what is more important, of the role of government in their development. For political reasons these matters could not be left to market forces. After the global financial crisis of 2008–09, public distrust of the market increased, and as a result policymakers have adopted new regulatory solutions and new policy agendas where the info-communications area has been given a prominent role. The US National Broadband Plan and the European Digital Agenda appeared as responses to the crisis and provided explanations of how the government was going to cope with the resulting problems, which was necessary in order to protect the positions of the established political leaders. If the issue could be explained by public interest theory, then it could reasonably be asked why, if the Digital Agenda is able to ‘spur innovation, economic growth and improvements in daily life for both citizens and businesses’ (European Commission 2010, p. 3), it was adopted only after the crisis struck the economy. Why was particular attention to the necessity ‘to maximise the social and economic potential of ... the internet’ (2010, p. 3) paid in 2010, but not 10 or 15 years before? Why did the FCC realise 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’ (FCC 2010, p. 109) by the end of the first decade of the twenty-first century, but not when the industry was liberalised and when all of these measures were already vital for the industry and for developing competition?

Meanwhile, more government intervention in the industry does not only mean that it reflects the public demand for more government and socially desirable objectives. It also reflects the interests of particular groups that are seeking rents from regulation, and the negative attitude of the public towards free market mechanisms helps these groups to promote their private interests (see Rajan and Zingales 2003). The claim that society helps the poorest social strata to be included in the growing information society through various kinds of fiscal support presents the issue in a misleading way. It gives a false impression of the real economic process, in which society invests public resources in the creation of private means of production that generate revenues and profits for their owners, even if some other members of society also benefit from the process.

There are robust reasons to assume that tackling the problems of the poorest through public support for private assets controlled by the rich contributes to the enrichment of the recipients of such support. Murray Rothbard’s (2006, pp. 196, 202) 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 a plausible explanation for the real causes of the growing social and economic problems that accompany the modern regulatory version of capitalism. And if indeed arguments about the important role of telecommunications in the economic activity of the modern world can hardly be challenged, the interventions designed to achieve objectives through the implemented methods bring rather negative consequences and form the link between the industry’s development and socio-economic problems.

## 7. Conclusion

The public interest approach as the grounds for intervention in the telecommunications industry has not been limited to economic rationales but has widely exploited ethical, paternalistic and other non-pecuniary justifications. Moreover, it is notable that in many instances the grounds for intervention

have incorporated different explanations at the same time. The ‘social justice’ grounds for the provision of telecommunications services for the poor and the disadvantaged have been supported by the market failure rationale of economies of scale. Paternalistic appeals to inclusivity of different social strata in the growing information society have been backed by the problem of high sunk costs, which has provided justifications for public subsidisation of network development.

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

Second, public interest theory does not explain the chosen modes of regulation and deregulation. Policymakers had a variety of tools that could change the structure of telecommunications markets and affect both the technologies and the architecture of the networks. Unfortunately, the liberalised paradise of the telecommunications area has taken the form of a transformation of a monopolistic state-owned industry into a highly concentrated field where powerful players have been protected by an ordered competition regime purportedly serving the public interest, and the universal service dogma has played a significant role in these new arrangements.

## Notes

1. For example, the EU regulatory framework for electronic communications networks and services (Directive 2002/21/EC, p. 39) 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’.
2. See, for example, the description of the UK ‘ordered competition’ model in Burton (1997). See also Lehman and Weisman (2000) and Yoo (2011).
3. Mueller argues that by the mid-1920s the household penetration in the US was about 30% (Mueller 2013, p. 145), while, for example, in West Germany the similar figures had been achieved only by the beginning of the 1970s (Noam 1992, pp. 77–8).
4. According to some estimates, ‘in 1902, out of 1051 incorporated cities in the United States with a population of more than 4000 persons, 1002 were provided with telephone facilities ... 451 [of the cities], almost half, were receiving duplicated service’ (Behling 1938, as quoted in Demsetz 1968, p. 59).
5. Clark (1923, p. 321), for example, argued that ‘Telephone companies ... show no signs of economy with increased size, but rather the opposite’.
6. Statement of A. S. Burlison, the US Postmaster General, on 18 June 1919 (58 Cong. Rec. 1342, 1919). <https://www.gpo.gov/2Ffdsys/2Fsearch/2Fpagedetails.action%3FcollectionCode%3DGPPO%26amp%3BgranuleId%3DGPPO-CRECB-1919-pt2-v58-6%26amp%3BpackageId%3DGPPO-CRECB-1919-pt2-v58%26amp%3BfromBrowse%3Dtrue> (accessed 5 April 2018).
7. Thierer (1994, p. 275) points out that it was ‘the one-way ticket, not only to universal service, but also to monopoly profits’. See also the analysis of the welfare costs of monopolies in Tullock (1967).
8. The US industry is not the only example. See also Noam (1992).
9. See, for example, the case of Wisconsin State in Janson and Yoo (2013).
10. Moreover, there have been claims that the natural monopoly theory is ‘exceedingly unclear’ and ‘illogical’ (Demsetz 1968, pp. 56, 59). As a result, the mainstream belief in subadditivity of local telephone services has been challenged by many scholars (Evans and Heckman 1983; Shin and Ying 1992; see also the discussion in Spulber and Yoo 2013).
11. Faulhaber (2003, p. 75), for example, noticed that among justifications of natural monopoly regulation was understanding that ‘entry restrictions permits pricing and investments by the monopolist aimed at achieving social objectives such as universal service without fear that cream-skimming entrants would undo non-cost-based pricing’.
12. The extreme case is the Russian Federation, where only the former Soviet monopoly benefits from the Universal Service Fund, when all telecommunication companies are obliged to contribute to the fund (see Federal Law on Communications of the 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).
13. Many contemporary studies express concerns that the trend towards accumulation of wealth in the hands of a few has become a common attribute of the new economy (Cingano 2014; Alvaredo et al. 2017).
14. USA, France, Italy, Russia, Nigeria, Afghanistan, India, and so forth (GSMA 2013).
15. E.g. in Chile and Paraguay (GSMA 2013).

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