PUBLIC SERVICE BROADCASTING AS A PUBLIC GOOD: CHALLENGES IN THE DIGITAL ERA

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ABSTRACT *This article presents a summary of the most important standpoints of the economic debate about public service broadcasting as a public good, and its provision in both the analogue and digital age of broadcasting. Due to frequent technological developments, which heavily influence the broadcasting sector, this debate, initiated in 1958 by American economist Paul A. Samuelson, has continued up to the present day. It also reflects on the concept of PSM as a public good in a globalizing, multi-platform, user-generated content infused media landscape. Finally, it ponders the future developments of PSM as a public good in the digital era of broadcasting.*

KEY WORDS

PUBLIC SERVICE BROADCASTING, PUBLIC SERVICE MEDIA, PUBLIC GOOD, DIGITAL ERA

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INTRODUCTION

Since its establishment in the 1920s, public television broadcasting (PSB) has been considered a public good. In terms of public goods theory, it is both non-rivalrous and non-excludable in consumption. Namely, watching a PSB program does not reduce its availability to additional users and once its program is broadcast no viewer can be excluded from watching them.

In the early days of broadcasting, due to the lack of a television market and the presence of radio spectrum scarcity, "broadcasting and other sectors such as telecommunications were seen as natural monopolies in which government intervention accounted for optimal outcomes" (Donders, 2012: 9). As a result, PSB monopolies were created. Unlike the European monopolistic model developed under the patronage of the state, "development of radio and television in the US was given over to the private sector, in which television was initially based as a commercial project." (Car, 2007: 114)

Deregulation of the media market in Europe, which occurred in the early 1980s ended the era of monopolies granted to PSBs (see Donders, 2012). Since then the number of television channels has rapidly risen, and new conditional access television platforms – cable and satellite television – have been introduced. New technologies, most importantly the innovation of conditional access which has enabled the exclusion of non-payers from the consumption of television programming, have posed a threat to the notion of PSB as a public good. Furthermore, the development of the television market and the end of spectrum scarcity has made the previous arguments for the governmental intervention in PSB obsolete.

In spite of gloomy prophecies and serious challenges from the television market's liberalization, multi-channel environment, market fragmentation and finally, questioning the justification of its existence in the new environment PSB has evolved towards public service media (PSM) and managed to survive in the digital era of broadcasting. Today, "public broadcasters are delivering programs online, deliver generalist and niche services, experiment with new sorts of services, explore the possibilities of interactivity, and continue to cut costs and diversify revenue streams." (Donders, 2012: 23)

However, in today's globalizing, multi-platform, user-generated content infused media landscape, can we still consider PSM to be a public good? Is it still non-rivalrous, meaning that it is enjoyed simultaneously by an unlimited number of consumers and has it remained non-excludable in the world where Internet access is the privilege of many, but not all?

This article presents a summary of the most important standpoints of the economic debate on PSB as a public good, initiated in 1958 by American economist Paul A. Samuelson. Due to frequent technological developments, which heavily influence the broadcasting sector, this debate has continued up to the present days, continuously challenging the notion that PSB is a public good. It also reflects on the concept of PSM as

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a public good in today's digital, multi-platform environment. Finally, this article ponders the future developments of PSM as a public good in the digital era of broadcasting.

THE NATURE AND PROVISION OF PUBLIC GOODS

Over the last two millenniums, the concept of the public goods and their optimal provision concerned the attention of scholars. This debate was initiated by the ancient Greek philosopher Plato in his masterpiece *The Republic* (Mansbridge, 1998; Petak, 2000; Heinaman, 2002; Pauletić, 2008; Etzioni, 2015). At the beginning of Book II, Plato distinguishes three classes of goods: (1) goods which we welcome for their own sake and independently of their consequences; (2) goods which are desirable not only in themselves, but also for their results; and (3) goods which no one would choose for their own sake, but only for the sake of some reward or result which flows from them (Plato, 2002). This classification provoked "multiple understandings about the concept of the public good that persists to this day." (Tierney, 2012: 13)

The foundation of modern public goods theory, "as the basis for a rationale for the productive state" (Brennan, 2012: 138), is often attributed to American economist Paul A. Samuelson. However, Katharina Holzinger (2008) argues that several elements of this theory – such as the existence of externalities and their undesirable effects on collective welfare, taxes or subsidies advocated to correct the inefficiencies induced by externalities, and the problem of 'just taxation' for the provision of public goods provided by governments – were developed earlier. "Borrowing from earlier writings of Wicksell (1896) and Lindahl (1919) and an early paper of Musgrave's (1939), the theory of public goods was an attempt to provide a systematic account of 'market failure'." (Brennan, 2012: 138) Nevertheless, "it was the contribution of Samuelson (1954), which finally launched the discipline of public good theory" (Holzinger, 2008: 12). To quote Richard Musgrave (1983: 141) "the modern theory of public goods may be dated from June 1954, when Samuelson's 'Pure Theory of Public Expenditures' appeared. Never have three pages had so great impact on the theory of public finance."

Public goods, as defined in economic theory, are goods which have two distinguishing characteristics. The first characteristic of a public good is jointness in consumption/non-rivalness, which "means that once the public good is produced additional consumers can consume it without reducing the consumption of others." (Holcombe, 2000: 201) Lighthouses, public roads, public parks and television broadcasting, to mention just a few, are examples of public goods.

This implies that the marginal cost of supplying the good to successive individuals is effectively zero, once the original costs of production have been incurred. Furthermore, it implies that the price charged for the service should also be zero, since any positive charge will prevent some consumers from enjoying a product which could be supplied to them for nothing. (Davies, 2004: 13-14)

Non-excludability, as the second characteristic of public goods, "means that once a good is produced, the producer cannot prevent consumers from consuming it."

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(Holcombe, 2000: 201) Since "everyone – whether they are old or young, hawk or pacifist, tax payer or tax evader – is said to be protected by it" (Malkin and Wildavsky, 1991: 358) national defense is recognized as non-excludable.

On the basis of a good's jointness in consumption and non-excludability, such goods can be classified into four broad categories: private goods, common-pool resources, club goods and public goods (Table 1).

Table 1. **Classification of Goods**

	Excludable	**Nonexcludable**
Rivalrous	Private goods (food, clothes, automobile)	Common-pool goods (underground water)
Nonrivalrous	Club goods (cable TV, electric power)	Public goods (national defense, lighthouse)

Source: F. Kartal, 2010: 155.

As Filiz Kartal (2010) argues, this twofold classification of goods – originating from Richard A. Musgrave and Peggy B. Musgrave (1973) and Vicent and Elinor Ostrom (1977) – is helpful for the conceptualization of public goods. Nevertheless, due to the changing social and technological conditions, it is not strictly determinate. He gives an example of a television signal, explaining that "Almost a half-century ago, a television signal was a pure public good as it was non-excludable and supplied at no charge. With the development of a technology that enables exclusion; a price for the provision of the good can be charged." (Kartal, 2010: 156)

While the market represents the optimal institution for the production of private goods, argues Elinor Ostrom (2009), public goods can only be provided by the government. Namely,

For non-private goods, on the other hand, one needed "the" government to impose rules and taxes to force self-interested individuals to contribute necessary resources and refrain from self-seeking activities. Without a hierarchical government to induce compliance, self-seeking citizens and officials would fail to generate efficient levels of public goods, such as peace and security, at multiple scales (Hobbes [1651] 1960; W. Wilson 1885). (cf. Ostrom, 2009: 409)

There are two reasons for the intervention of government in this regard. On the one hand, "the marginal cost of public goods provision to a new users is zero, thus, the charge for the goods should be zero. For this reason, the private sector is unwilling to provide pure public goods" (Kartal, 2010: 156). As a result, public goods will be under-produced in the market. On the other hand, since public goods are freely available to all, regardless of their contribution, consumers will have the tendency to free ride. To quote Samuelson "it is in the selfish interest of each person to give false signals, to pretend to have less interest in a given collective consumption activity than he really has." (1954: 388-389) Since fewer consumers will be willing to pay for the production of a public good, less of the good

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will is produced. In this situation of market failure, a government is seen as the only actor who is, using some form of enforcement (such as revenues collected by taxes) capable of public goods provision.

The existence of externalities represents another aspect of market failure in provision of public goods.

According to Baumol and Oates (1988), an externality is an unintentional effect on an economic decision made by persons, corporations, or governments on the consumption or production by an outside party (person, corporation, or government) who is not part of the original decision. (Ganapati Bhat, 2010: 228)

If this "unintended 'spill over' of any good" (Baumol and Oates, 1975) is positive and benefits others, it is referred to as a positive externality. The examples of positive externalities are education, national security and law enforcement, which all benefit the whole society. However, if it is negative and results with costs to the third parties, they are referred to as negative externalities. The example of a negative externality is pollution, which imposes health problems and costs to the community within its range.

In sum, the free riding and the existence of externalities in the provision of public goods legitimizes the need for governmental action in order to ensure free provision of these goods to the society.

TELEVISION BROADCASTING IN THE CONTEXT OF PUBLIC GOODS

Since the mid 1950s economic literature, television broadcasting has been given as an example of a pure public good – a good which is both non-rival and non-exclusive in consumption (Samuelson, 1958, 1964, 1967; Minasian, 1964, 1967; Buchanan, 1967; Long, 1994; Holcombe, 1997; Pindyck and Rubinfield, 1989; Anderson and Coate, 2000; Kartal, 2010; Davies, 2004, 2013; Levy, 2013; Graham, 2013; Helm, 2013). Barwise and Pickard (2012) explain broadcasting as a public good:

Because (a) those who would not pay could not be excluded from receiving broadcasts and (b) everyone could receive broadcasts without reducing its availability to others, broadcasting before the advent of conditional access technology was what economists call a public *good, that is, a good which is both 'non-excludable' and 'non-rivalrous'. This meant that the development and effective operation of a commercial broadcast marketplace would be constrained by 'free-riding', with those who did not pay enjoying the benefits of others' expenditure, like someone riding a bus or train without paying.* (Barwise and Pickard, 2012: 11)

However, during the nearly hundred years long history of broadcasting, changes in technology have influenced and changed the very nature of this public good. For example, in the context of public goods theory, it is possible to distinguish between three notions of the television broadcasting (Table 2), coinciding with the history of broadcasting phases introduced by Karin Donders (2012). Using this analogy, similar division could be used for radio broadcasting or PSM services.

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Table 2. **Television broadcasting in the context of public goods theory (1920s-onwards)**

	1920s-1980s		
	Subtractability of Use	High	Low
Difficulty of Excluding Potential Beneficiaries	High	Common-pool Resource	Public Good **Free-To-Air Terrestrial TV**
	Low	Private Good	Toll Good
	1980s-2000s		
	Subtractability of Use	High	Low
Difficulty of Excluding Potential Beneficiaries	High	Common-pool Resource	Public Good **Free-To-Air Terrestrial TV**
	Low	Private Good	Toll Good **Satellite TV** **Cable TV**
	2000s-onwards		
	Subtractability of Use	High	Low
Difficulty of Excluding Potential Beneficiaries	High	Common-pool Resource	Public Good **Free-To-Air Terrestrial TV**
	Low	Private Good **TV Internet services (TV on demand, i-TV services, etc.)** **mobile application services**	Toll Good **Satellite TV** **Cable TV** **IPTV** **Pay-Per-View Terrestrial TV**

Source: Adapted from E. Ostrom, 2005: 24.

According to the first notion, which refers to the period from the 1920s to the 1980s, television broadcasting is considered to be a public good. Namely, in the early decades of broadcasting, television signals were broadcasted exclusively 'over the air' (that is over the terrestrial analogue free-to-air television platform). The television market did not exist and only public broadcasters were licensed to broadcast on the terrestrial analogue free-to-air television platform. As Gavyn Davies (2004: 14) argues, traditional analogue broadcasting represents "almost the perfect textbook example of a public good". Namely,

once the analogue signal has been provided for a single user, there is no extra cost for providing it to everyone in the same locality, so the product is clearly non-rivalrous. Furthermore, once you have provided the signal for any household, you cannot exclude all other households, so it is also non-excludable. (Davies, 2004: 14)

The arrival of cable and satellite transmissions of TV signals in the 1980s, which unlike terrestrial television, use the scrambling technology to exclude non-payers from

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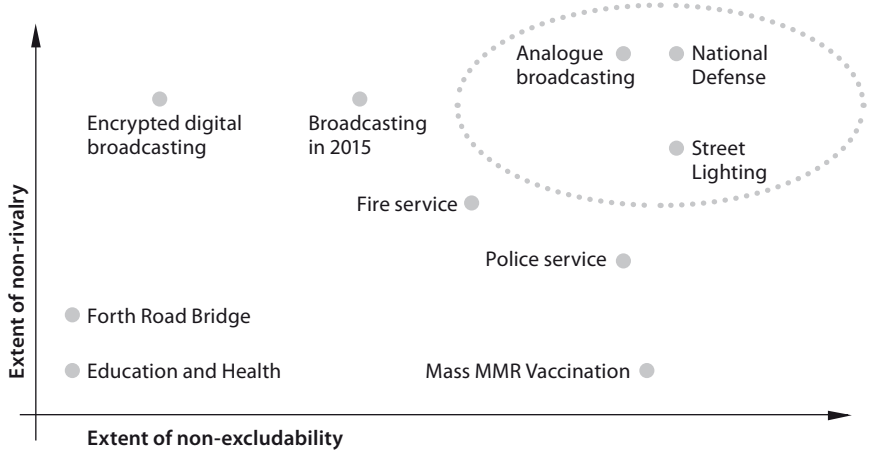
the consumption of the broadcast, has altered the nature of television broadcasting as a public good. Since it became technologically possible to produce a television signal from which non-payers are excluded, broadcasting over cable and satellite television platforms became a club good. "Once exclusion can be practiced, the private sector can provide the good, charge a price for it, and earn a normal rate of return on its investment." (Batina and Ihori, 2005: 2) However, broadcasts over the terrestrial television platform have remained non-rivalrous and non-excludable, thus retaining the properties of a public good.

Finally, according to the third notion, which refers to the period from the 2000s onward, terrestrial television broadcasting became a dual good: both a public and a club good. Another technological innovation, the digital terrestrial television switchover, opened the possibility of scrambling technology to exclude non-payers from the consumption of television broadcasts, even on the terrestrial television platform. As a result of the digital switchover, terrestrial television broadcasting became a dual good. On the one hand, by encoding TV channels broadcasted over the digital terrestrial platform and introducing Pay-Per-View terrestrial TV, technology has allowed for the exclusion of non-payers from the jointly enjoyed good. Hence, television terrestrial broadcasting became a club good. On the other hand, a part of broadcasting over the terrestrial television platform remained non-rival and non-excludable in consumption, thus remaining a public good in the digital era of broadcasting as well. Finally, the evolution of PSB towards PSM has introduced new platforms to deliver public service programming and services, such as PSM online radio, TV on demand, i-services, and PSM mobile application services. On the basis of their public good's characteristics, these services are defined as private or public goods. In this context, it is interesting to present the comparison between three types of broadcasting (encrypted digital broadcasting, broadcasting in 2015 and analogue broadcasting) and other public goods (Figure 1).



▲ *Figure 1.*
Television broadcasting compared with other public goods
Source: Davies, 2004: 15.

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Based on the extent to which public service media exhibits the characteristics of non-rivalry and non-excludability, Davies (2004) observed that analogue broadcasting is almost a pure public good, since both its extent of non-rivalry and non-excludability are high. On the other hand, encrypted digital broadcasting, due to the possibility of excluding non-payers, is positioned at the top left and estimation of broadcasting market in 2015 in the middle top.[1] Davies concludes that these findings "would leave broadcasting at the end of the next charter period exhibiting far more of the characteristics of a public good than many other services provided by the public sector" (2004: 15).

PSB AS A PUBLIC GOOD

Unlike television broadcasting, whose nature in the context of public goods theory has been altered during its history, PSB has retained its characteristics of a public good. Namely, from its establishment, in the 1920s until the 2000s PSB was considered to be a public good (Campbell and Campbell, 1978; Andreoni, 1995; Shankar and Pavitt, 2002; Balnaves et al., 2008; Besanko and Braeutigam, 2010; Parks et al., 2013). It was non-rival since "when one viewer watches a public television program, no other viewer is prevented from watching it (to put another way, the marginal costs of serving an additional viewer is zero)" and non-excludable since "once the television programme is broadcast, no viewer can be excluded from watching it" (Besanko and Braeutigam, 2010: 699). As Mike Feintuck and Mike Varney suggest, "it is evident that my watching of BBC1 at a particular time does not prevent my neighbour from doing so, and, furthermore, if I have a television set then I may watch television regardless of whether I have purchased a television licence" (2006: 91).

It should be noted that PSBs have historically used the terrestrial analogue television transmission platform (free-to-air), which was the only available television platform at that time. "Free-to-air refers to a delivery model where PSB services are available to all viewers and listeners without recurring charges." (European Broadcasting Union, 2014: 2) Thus, everyone who possessed a TV set and antenna could (and still can) watch PSB's programs regardless of paying subscription fee. Furthermore, "in many countries there is a legal or licensing obligation for DTT[2] to be available to a large proportion of the population (e.g. more than 98 %)." (European Broadcasting Union, 2014: 3) Thus the terrestrial television platform, allows for universal and free access of public service broadcasters. This is of utmost importance since "the social cohesion function of PSB only works if everyone can receive it, and in many countries including the United Kingdom, Spain and Italy, terrestrial television has been the way of meeting this universal service obligation." (Sims et al., 2015: 80)

It is the inability to exclude non-payers from the consumption of PSB's program – broadcasted via free-to-air television platform – that creates a social dilemma for their

[1] The analogue transmission of terrestrial television signal in the UK ceased on 24 October 2012. Thus instead of analogue broadcasting service there is free-to-air digital terrestrial broadcasting. Due to the high extent of non-rivalry and non-excludability it would still be positioned at the top left corner of Figure 1.
[2] DTT is abbreviation for the Digital Terrestrial Television.

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viewers: since they can watch PSB program without paying for it, they tend to free-ride, i.e. to enjoy PSB program without contributing for its production. This results with a conflict between individual and collective rationality. As Anisha Shankar and Charles Pavitt indicate

although one person's decision to not contribute does not have a significant impact on the quality or quantity of programming that is broadcast, if too many acted in this way, the television station would not have the funds to continue broadcasting and would eventually have to shut down. Although in the short term all non-paying viewers would have benefited, everyone would suffer in the end. (2002: 255)

For example, if we compare data on the number of households, individual public service television subscribers and the number of private households in Croatia who owned a TV set in 2014, we will notice that 21.4 % of households who own a TV set do not pay the PSB subscription fee, thus not contributing to the production of PSB programs. The direct consequence of this problem is reduced funding for the provision of this public good. However, although the Croatian Radio-Television Act (OG 137/10, 76/12) anticipates penalties for natural and legal persons who do not register their radio-television receiver or use an unregistered one to watch television programs (Article 47 and Article 48), due to the absence of technological prerequisites, it cannot prevent any person who does not pay their subscription fee from consuming television programs.[3] "Even in countries like Britain and Japan, where fee collection is authorized, there is no way of excluding people who do not pay the fee short of seizing their TV receivers." (Hart, 2007: 18)

During the first decades of broadcasting, market failures were a common argument for encouraging the provision of PSB. The main reasons for market failure in broadcasting were: spectrum scarcity, monopoly, public good, externalities and merit good (Davies, 2004; Feintuck and Varney, 2006; Armstrong and Weeds, 2007; Brevini, 2013; Levy, 2013). "These represent clear deviations from the assumptions which are required in welfare economics to ensure that the free market produces a socially optimum result." (Davies, 2004: 12-13)

The Spectrum scarcity argument. During the first decades of broadcasting "spectrum constraints required that just a few television channels could broadcast simultaneously" (Armstrong, 2005: 284), thus limiting market competition.

Scarcity stems from the fact that at any given point in time and place the use of a specific slice of the spectrum (i.e., a specific frequency range) typically precludes alternative uses. Without coordination, interference can distort transmissions to a point that effectively prevents reliable communication. (Galperin, 2004: 43-44)

Consequently, the need for the establishment of a coordination mechanism legitimized the government allocation of radio spectrum.

The Monopoly argument. Due to the existence of spectrum scarcity since the 1920s governments established public broadcasting monopolies throughout Europe. It was a

[3] More on overview of the digital television switchover process in Croatia in Car and Andrijašević, 2012; Andrijašević and Car, 2013.

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general expectation "that the commercial broadcasting market will fail to meet viewers' demands in a number of important respects. Advertising funded broadcasters will produce a bland diet of low quality programmes, appealing to mass market tastes and ignoring niche interests." (Armstrong and Weeds, 2007: 1) Thus, the historical and institutional role of PSB was, argue Nakamura and Yonekura (2008: 109), "to compensate for 'market failure' by the commercial stations that predated it".

The Public good argument. Since PSB has both the non-rivalry and non-excludability characteristics of a public good, as previously described, the market will tend to under-produce this good.

The Externalities argument. PSB generates mostly positive externalities, such as "more knowledgeable citizens benefits fellow citizens; expression of shared cultural values can strengthen social cohesion and national identity" (Levy, 2013: 33). Furthermore, it advances the non-economic goals of society, such as the diversity of viewpoint and media plurality, which empowers citizens with information and promotes civic engagement, and preservation of domestic culture, primarily in the European Union. According to microeconomic theory, Helen Weeds (2013: 16) argues:

in the presence of positive externalities goods tend to be underprovided by the market, because the transaction between buyer and seller takes no account of benefits to other parties. If externalities cannot be internalised then there is a case for public intervention to increase the supply of socially beneficial programmes (and to limit harmful ones). This rationale for intervention would call for a targeted approach in which public funds are used to produce programming which confers social benefits and to distribute this material as widely as possible.

The Merit good argument. In economic theory, merit goods are defined as "goods the consumption of which is beneficial rather than enjoyable (Robinson, Ravel and Low, 2005: 108)." (cf. Brevini, 2013: 159) Leaving the production of such goods to the market could result with their inadequate provision. In this regard,

PSBs have been considered a suitable means of generating programming that has merit good attributes (equal programming, programming of national political or cultural significance, programmes aimed at minority communities or interests, educational programming), as they are not beholden to shareholders to make a profit, or obliged to maximise advertiser revenues or audience share across the programming schedule. (Cunningham et al., 2015: 130)

The deregulation of the media market in Europe, which occurred in the early 1980s ended the era of monopolies granted to PSBs (see Donders, 2012). A dark shadow of pessimistic prophesies has loomed over the PSBs since. In the 1980s and 1990s influential media and communications scholars, such as Karol Jakubowicz, Robert McChesney and Peter Dahlgren anticipated a reduction in its social impact. More radical was Michael Tracey, who in 1998, expressed skepticism about the future of PSB in Europe. Tracey argued that it became nothing more than the "corpse on leave" whose preservation "will be more akin to the preservation of primeval bugs in amber than the continuance of any vibrant cultural species." (1998: 33)

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The introduction of conditional access to television programming, i.e., the possibility of excluding non-payers from the consumption of television programming, has challenged the notion of PSB as a public good. However, its traditional bond with the free-to-air terrestrial television platform which continued in the digital era of broadcasting allowed for the preservation of its characteristics of a public good as it remained both non-rivalrous and non-excludable until the 2000s.

CONTEMPORARY PSM AND ITS FUTURE DEVELOPMENTS

Since its establishment in the 1920s, PSB ensured the provision of free-to-air broadcasting that did "not exclude people on the basis of ability or willingness to pay and the provision of certain types of welfare enhancing programming that the market alone would not provide." (Ofcom, 1999: 204) Until the 2000s, PSB maintained the characteristics of a public good. It was both non-rivalrous and non-excludable in consumption.

However, does PSM functions today as a public good?

The answer to this question is ambiguous. The ubiquitous of Internet and mobile technologies and evolution of globalizing, multi-platform, user-generated content infused media landscape have undoubtedly influenced the notion of PSM in the theory of public goods. The galloping technological development that has occurred in the past decade has challenged both its non-rivalry and non-excludability characteristics. Thus, in order to answer the above raised question, we should first consider whether PSM still posses the characteristics of a public good.

As PSM is available on various platforms, such as digital broadcasting services (terrestrial, satellite, cable, IPTV), radio services, Internet services, mobile application services – to mention the most important ones – each of these services should be perceived as a separate part of PSM. Here I briefly explain each one within the context of public goods theory.

>PSM digital broadcasting services (terrestrial, satellite, cable, IPTV) are non-rival in consumption, regardless of whether PSM programming and services are broadcasted free-to-air or via satellite, cable and IPTV. The consumption of PSM programming and services by one individual does not prevent simultaneous consumption by other individuals. Additionally, the costs of providing PSM programming and services to additional individuals are zero. Furthermore, PSM digital broadcasting services are both excludable and non-excludable in consumption. Digital terrestrial broadcasting service, broadcasted free-to-air, is non-excludable since it is not possible to exclude anyone who possesses a TV set and antenna from the consumption of public service programming. On the other hand, due to the 'scrambling' technology, satellite, cable and IPTV platforms can exclude non-payers from the consumption of public service programming;

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>PSM radio services are both non-rival and rival in consumption. Namely, analogue free-to-air radio broadcasting of PSM programming and services can be enjoyed simultaneously by an unlimited number of listeners who possess radio and antenna, and again the costs of providing PSM programming and services to additional individuals are zero. Thus, it is non-rival. At the same time, no one can be excluded from the free-to-air radio listening. However, if too many listeners decide to listen to PSM radio online at the same time, this might result in the crash of the server and the inability to enjoy PSM radio by all listeners. On the other hand, the upgrade of a server for a larger audience shall result in additional costs. Consequently, PSM radio online is rivalrous in consumption. At the same time, PSM online radio services are excludable since those who do not pay for Internet access cannot access PSM programming and services online. Also, due to the 'digital divide' a large part of the world population does not have access to PSM services online. "Globally 3.2 billion people are using the Internet by end 2015 [...]. However, 4 billion people from developing countries remain offline representing 2/3 of the population residing in developing countries." (International Telecommunications Union, 2015: 1);

>PSM Internet services are rivalrous in consumption. As in the case of online radio, if too many users decide to approach PSM at the same time, this might result in the crash of the server and the inability to consume PSM Internet services. Also, the upgrade of a server for a larger audience shall result in additional costs. On the other hand, these services are excludable since those who do not pay for Internet access cannot reach them. The above stated 'digital divide' argument applies in this case as well;

>PSM mobile applications services are rivalrous in consumption as well. Due to the server limitations, it cannot be enjoyed simultaneously by an unlimited number of users while the investments in a server upgrade result in additional costs. Further, these services are excludable since those who do not pay for mobile service or/and broadband Internet access cannot reach them. The above stated 'digital-gap' argument applies in this case as well.

This brief explanation of separate parts of PSM in the context of public goods theory provides several answers to our question. First, PSM does not function as a public good when either the access to public service programming and services is restricted for non-payers (satellite, cable and Internet broadcasting, PSM online radio, PSM Internet services and PSM mobile application) or when PSM services are rivalrous (PSM online radio, PSM Internet services and PSM mobile application). Second, PSM does not function as a public good in cases when it is not available under the same conditions. On the one hand, we are facing the 'digital divide' and the fact that Internet and mobile broadband is not a privilege for all, but many. On the other hand, at the global level the price and speed of Internet and mobile services varies among states. "In developing countries, average monthly fixed broadband prices (in PPP$) are 3 times higher than in developed countries; mobile broadband prices are twice as expensive as in developed countries." (International Telecommunications Union, 2015: 4) In early 2014, the speed of fixed broadband subscriptions per 100 inhabitants reached from >256 kbit/s to <2Mbit/s in Pakistan, Senegal and Bolivia to >10 Mbit/s in Republic of Korea, France and Iceland

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(International Telecommunications Union, 2015). Third, contemporary PSM functions as a public good only in the case of digital terrestrial television broadcasting and analogue radio broadcasting. These two services, as the parts of PSM, are non-rivalrous and non-excludable in consumption, i.e., they have the characteristics of public goods. Thus it seems that PSM may be considered to be a public good only when the technological platform used for the dissemination of its programming and services (in this case free-to-air terrestrial platform) is in accordance with the definition of a public good.

These answers open another important question – are market failure (in terms of free-riders) and the existence of externalities in the digital multi-channel media environment sufficient arguments to justify government intervention in the provision of PSM? Most scholars believe so, although in a somewhat altered manner. Mark Armstrong (2005: 281) argues that the advent of subscription television has overcome many of the market failures that once existed. However, not all of them. Thus the existence of externalities and 'citizenship concerns' provide a case for continued public intervention, but in a limited form.

As Davies (2004: 13) implied, market failures in the broadcasting sector "have not disappeared simply because technology has gone digital, despite assumptions to the contrary. Indeed, they will be with us for a very long time." Namely,

some form of market failure must lie at the heart of any concept of public service broadcasting. Beyond simply using the catch-phrase that public service broadcasting must 'inform, educate and entertain', we must add 'inform, educate and entertain in a way which the private sector, left unregulated, would not do'. Otherwise, why not leave matters entirely to the private sector? (Department for Culture, Media and Sport, 1999: 10)

Furthermore, Armstrong and Weeds (2007: 82) noted that, while the public intervention in broadcasting during the analogue era of broadcasting was justified with the traditional market failure argument, in the digital era of broadcasting "the rationale for public intervention needs to be re-examined", since "regulation that was appropriate to the earlier, analogue era may become unnecessary, and even undesirable, in the digital world." Considering the rationale for public intervention in broadcasting in the digital era, Weeds argued that,

traditional consumer market failures of analogue, free-to-air broadcasting do not carry over to the digital world: the market will provide the programmes that people broadly want to watch. The rationale for public intervention in broadcasting must now rest on citizen concerns. While there is a case for continued intervention to increase the provision of programming that conveys positive social externalities, its effectiveness is limited if consumers increasingly turn to other broadcasters and alternative products to satisfy their needs for information and entertainment. (2013: 19)

Having in mind that PSM creates positive externalities not provided by the market, Weeds concludes that "contemporary public intervention is consequently justifiable but not at the levels that harm commercial firms, investment in broadcasting, or reduce the total welfare of the broadcast systems." (2013: 5)

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In this context, at least one possible direction of the future developments of PSM may be recognized. It was initiated in 2011, when the Human Rights Council of the United Nations (UN) declared Internet access a human right. The UN described the Internet as "one of the most powerful instruments of the 21st century for increasing transparency in the conduct of the powerful, access to information, and for facilitating active citizen participation in building democratic societies." (United Nations, 2011: 4) As such Internet can be understood as a strong instrument for supporting PSM's contemporary endeavors.

A further step forward would be to recognize access to the Internet as not just a mere policy goal, but as a human right, with a corresponding obligation on the State to ensure its exercise. It has be so defined (or mandated in law as a service that must be available to everyone) in Estonia, France, Costa Rica, Finland, Malta, Switzerland and Spain, with different technical specifications in each country as to what it entails in practice. The European Union, too, has to all intents and purposes recognized Internet access as a human right in Article 1.3a of Directive 2002/21/EC of 7 March 2002 on a common regulatory framework for electronic communications networks and services (as amended). (Jakubowicz, 2015: 312-313)

Under this scenario, the Internet could supplement traditional terrestrial television's universal coverage and the free access proposition of PSM programming and services. As a result, PSM could become both non-rivalrous and non-excludable in consumption. If the Internet, as a global human right, becomes accessible to all citizens of the world under the same conditions, in the 21st century PSM could become reinvented as a public good.

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JAVNA RADIO-TELEVIZIJA KAO JAVNO DOBRO: IZAZOVI DIGITALNOG DOBA

Ivana Andrijašević

SAŽETAK *Članak donosi sažetak najvažnijih stajališta iz ekonomske teorije o javnoj radio-televiziji kao javnom dobru i osiguranju njezine ponude tijekom analognog i digitalnog razdoblja televizijskog emitiranja. Zbog čestih tehnoloških promjena koje značajno utječu na elektroničke medije rasprava o javnom radio-televizijskom servisu kao javnom dobru, koju je 1958. godine započeo američki ekonomist Paul A. Samuelson, nastavila se do danas. U članku se također prikazuje koncept javnog medijskog servisa kao javnog dobra u globalnom, višeplatformskom, korisnički usmjerenom medijskom okruženju. Na kraju se promišlja o budućem razvoju javnog medijskog servisa kao javnog dobra u digitalnom dobu emitiranja.*

KLJUČNE RIJEČI

JAVNA RADIO-TELEVIZIJA, JAVNI MEDIJSKI SERVIS, JAVNO DOBRO, DIGITALNO DOBA

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