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A PREPARATORY STUDY FOR
THE DTT AUCTION IN GREECE:
NUMBER OF LICENSES AND
RESERVE PRICE



The FSR Communications and Media

The Florence School of Regulation - Communications and Media (FSR C&M) is an initiative of the European University Institute (EUI), which is specifically located at the Robert Schuman Centre for Advanced Studies (RSCAS). As part of the EUI, the FSR C&M works closely with the European Commission and with the body of European Regulators of Electronic Communications (BEREC). In addition, it has established institutional partnerships with the Independent Regulators Group (IRG).

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I. INTRODUCTION

In October 2015, the Greek Parliament voted on new legislation concerning, among other things, the digital terrestrial television broadcasting licensing procedure for private TV stations¹. The new framework aims to regulate the field, after years of private TV broadcasting on “temporary” licenses, which were issued 25 years ago. Under the new framework, the Greek regulatory Authority (the National Board of Radio and Television – hereinafter, ESR) will issue a number of licenses to television content providers, after a highest-bid auction process. The number of licenses will be determined by a majority vote of the Greek Parliament, following the Minister of State’s proposal, and after public deliberation and consultation with the ESR, and both Greek and international experts². The initial price of the license is to be determined by a joint decision of the Ministers of State responsible for Communications and Media and Finance.

At the request of the Greek Minister of State, the Florence School of Regulation, Communication and the Media Area, has set up a group of international experts to carry-on this independent academic study, which aims to provide a documented opinion on the above mentioned two issues, namely, (a) how many nationwide television broadcasting licenses should be issued? And, (b) what should the auction’s starting price be?

The study is structured as follows. The first part provides an overview of the Greek television landscape, and more precisely, of the market for digital terrestrial television (DTT) broadcasting. In addition, it analyses the main provisions of the law that was recently approved by the Greek Parliament on the matter, and its most immediate practical consequences for the market. The second part proposes an answer to the first research question of this study, i.e., how many nationwide television broadcasting licenses should be issued by the Ministry of State. In order to do so, it looks at the current Greek frequency plan, suggests the adoption of a new one that is more in line with the relevant European and international frameworks, and, finally, it provides indications of the number of licenses to be issued. The third part focuses on the identification of the starting price for the auctions. With these aims, it uses a benchmarking methodology, that takes into account two different benchmarking possibilities, and it applies all the necessary adjustments in the Greek context. The last part of the study concludes by putting forward some general policy considerations and suggestions.

II. BACKGROUND TO THE STUDY: THE GREEK TELEVISION LANDSCAPE AND THE NEW LAW

Television broadcasting was introduced in Greece in 1966 with its first network, the Hellenic Broadcasting Corporation, a state-owned monopoly, broadcasting out of Athens. The State monopoly in television and radio broadcasting was abolished at the end of the ‘80s by means of Law n. 1866/1989³. Under the provisions of this law, a number of licenses were issued and were attributed without any contest or similar instrument. At the same time, various TV stations started to operate without a license. In parallel, many media outlets appeared in the market (Iosifidis, Boucas, 2015).

¹ Law n. 4339/2015 of 24 October 2015, available at: http://www.hellenicparliament.gr/en/Nomothetiko-Ergo/Anazitisi-Nomothetikou-Ergou?law_id=8b57b26c-2490-4a56-abb7-a536013f3790

² Article 2 of Law n. 4339/2015 originally provided that the number of licences had to be determined by decision of the Ministry of State, after public consultation and the issuing of a documented opinion by the ESR. However, on 29 January 2016, the Greek Parliament approved a law, which modified the text of Law n. 4339/2015 attributing to the Parliament the power to determine the number of licences to be issued. At the moment this study is submitted, no further information is available on the new law.

³ Available at: <http://www.sde.gr/wp-content/uploads/2012/10/1866-1989.doc>.

However, the dimension of this market, estimated at roughly 11 million people, led to the current situation of excessive supply over demand (Papathanassopoulos, 2014). In fact, at the moment, in Greece there are over 150 private TV channels (Iosifidis, Boucas, 2015). The number includes three categories of channels: nationwide - for broadcasting throughout the country, regional - for projection in each Greek region, and local, which limits broadcasting to a narrower, local scale. However, it is to be noted that Article 37 of Law n. 4262/2014⁴ has grouped the TV channels into two categories only: nationwide ones, and regional ones, which also integrate the local.

One of the peculiarities of Greek private TV broadcasting is that, currently, channels hold either no license or only a temporary license, which have been renewed by means of subsequent legislative interventions. The first of these interventions was Law n. 2173/1993⁵, which allowed for the establishment of private national TV channels, thereby legitimising the channels that, by then, had already entered the market without a license. Afterwards, Law n. 2828/1995 set the basic operational framework for private TV broadcasting. More specifically, it introduced a contest procedure for the granting of licenses for private TV stations, while recognising the majority of the stations already broadcasting as operating legally. The law also established that private stations were obliged to provide programmes of high quality, objective information and news reporting, and the promotion of cultural diversity.

In 2003, 8 years later, Presidential Decree n. 234/2003⁶ set the details for a contest procedure for the assignment of licenses for private TV channels. Afterwards, the relevant procedure was launched by the ESR, but it was never completed and was finally abolished. Meanwhile, through subsequent laws, the deadline set for the procedure to grant nationwide TV broadcasting licenses, as well as the expiration date of the already assigned temporary licenses, were continuously postponed. Finally, Law n. 3021/2002⁷ extended the duration of the temporary TV broadcasting licenses without establishing any end-dates.

In 2007, Law n. 3592/2007⁸ confirmed the legitimacy of the activity of all existing TV channels and reintroduced a contest procedure for the assignment of definitive broadcasting licenses. Again, the date established for the auction to take place was extended – through consecutive legislative interventions – until the 31st December 2014. Meanwhile, a number of the provisions of Law n. 3592/2007 were modified by Law n. 4070/2012⁹, whose scope was, among others, to align the overall regulatory framework with the so-called “passage to the digital era”; and consequently the legitimacy of the broadcasting activities of all temporary license-holding TV stations was confirmed and expanded “until the point when the contest would take place”

What is described above is, in brief, the scenario in which the recently approved Law n. 4339/2015 is due to operate. This law, approved by the Parliament in 24 October 2015, deals, amongst other things, with the licensing of digital terrestrial television to free reception content providers. In particular, Article 1 establishes that the licensing of the broadcasting content providers will take place through an auction, and adds that both national and regional licenses will be granted. Article 2

⁴ Law n. 4262/2014 of 09 May 2014, available at: http://www.hellenicparliament.gr/Nomothetiko-Ergo/Anazitisi-Nomothetikou-Ergou?law_id=88db4e45-e5eb-49db-8771-9f210aaedce4

⁵ Law n. 2173/1993 of 14 December 1993, available at: http://www.hellenicparliament.gr/Nomothetiko-Ergo/Anazitisi-Nomothetikou-Ergou?law_id=0a73af1a-5ea7-4626-83e3-5ab4fe997f6d

⁶ Presidential Decree n. 234/2003 of 01 September 2003, available at: <https://www.e-nomothesia.gr/enemerose-tupos-radiophono-teleorase/pd-234-2003.html>

⁷ Law n. 3012/2002 of 03 June 2002, available at: http://www.hellenicparliament.gr/Nomothetiko-Ergo/Anazitisi-Nomothetikou-Ergou?law_id=97b5c05c-3adb-4856-b1ec-04475b9abd54

⁸ Law n. 3592/2007 of 05 July 2007, available at: http://www.hellenicparliament.gr/Nomothetiko-Ergo/Anazitisi-Nomothetikou-Ergou?law_id=638dbd18-0071-43a1-ba17-524482d2f7e5

⁹ Law n. 4070/2012 of 06 April 2012, available at: http://www.hellenicparliament.gr/Nomothetiko-Ergo/Anazitisi-Nomothetikou-Ergou?law_id=9ec71e4e-e32e-4076-9a4f-e028c870ac9d

specifies that the number of licenses per category (i.e., national or regional) shall be fixed at the decision of the Ministry of State, after public consultation and the issuing of a documented opinion by the ESR. It also states that the starting price the auction shall be indicated by a common decision of the Ministry of Finance and the Ministry of State, again after the issuing of a documented opinion by the ESR. The licenses will have 10 year duration, starting from their date of issue, and the auction process will be launched and managed by the ESR. Article 13 of the law requires the auction to be conducted through a multiple rounds procedure, with bids increasing in value from the starting price. In the case of non-satisfactory participation, the ESR may cancel the contest, or may re-launch it for a lower number of licenses.

As derives from the above, in as far as the concerns of the auction, the major actors are the Ministries of State and Finance, and the ESR. In the former's hands lie the power to suggest how many licenses must be issued, and what the starting price of the auction will be, although, in both instances, the ESR's documented opinion will contribute to the decision-making process.

The ESR, as mentioned, is the Greek National Council for Radio and Television, the independent administrative authority, which was founded in 1989¹⁰, and which supervises and regulates the radio and television landscape in Greece. It is a seven member body consisting of a President, a Vice-President, and five members, all appointed by the Greek Parliament with a consensus of all political parties. The ESR is a member of both the European Platform of Regulatory Authorities (EPRA) and the Mediterranean Regulatory Authorities Network. The main tasks of the ESR are:

- ✓ granting, renewing or revoking licenses for radio and TV channels;
- ✓ monitoring compliance with the legislation regarding ownership restrictions as to the possession of Radio or TV stations, and publishing information regarding the ownership status of Radio and TV stations;
- ✓ monitoring Radio and TV programmes so as to ensure: (a) the objective and balanced coverage of news and information, as well as of artistic and cultural works, as required by the Constitution, and (b) the quality standards required by the social aspects of Radio and Television, in conformity with the cultural standards of Greek society and the need to protect human values and the interests of children and the young;
- ✓ supervising free competition and market abuses in the media and communication industry, in conjunction with the Hellenic Telecommunications and Post Commission and the Hellenic Competition Commission;
- ✓ imposing fines and administrative sanctions in cases for which provision is made in law;
- ✓ drawing up the guidelines for codes of conduct to be applied on news broadcasts, advertisements and entertainment programmes, which are then promulgated by law.

Under Law n. 4339/2015, the ESR has the responsibility to run the auctions, from providing details about the minimum technical specifications being requested for each category of license, to checking the sources and the means used by participants to obtain the financial means that will be used to pay for the bid.

In order to complete the picture of the Greek television landscape, and thus to set the scenario where our analysis will take place, it might be useful to recall that currently, in Greece, there are eight nationwide TV channels: MEGA Channel, ANT1, ALPHA, STAR Channel, SKAI TV, ART, Epsilon (a new player, present since 2013) and Makedonia TV. The ninth one, ALTER, went bankrupt in 2012. Additionally, ART and Makedonia are actually marginal in terms of viewership, and Makedonia is a regional TV channel, covering mostly northern Greece, but it is transmitted nationwide. MEGA

¹⁰ The ESR was founded by Law n. 1866/1989, amended by n. Law 683/2000 and Law n.3051/2002, available at: http://www.hellenicparliament.gr/Nomothetiko-Ergo/Anazitisi-Nomothetikou-Ergou?law_id=75ce4691-ecac-4440-b9a7-73d8909f7112.

Channel is the most popular TV channel, with a daily audience market share of 22 percent in 2013 and an annual turnover of 63.5578.541 Euros. This is followed by ANT1, with a 17.3 percent audience share and an annual turnover of 59.588.895 Euros¹¹. It should be noted that all nationwide TV channels have financial problems, as they have accumulated large financial obligations, exceeding, in total, 700 million Euros¹².

A mention is due also to the specificities of the Greek network for the transmission of private nationwide TV channels. In July 2009, Digea Digital Service Provider S.A. (Digea) was established, in order to provide Greek households with digital television signal. Digea's core service offerings involve networking, multiplexing and broadcasting for DTT in Greece. Despite the fact that, in order to avoid market concentration, Law n. 3592/2007 prohibits network providers from also being content providers, Digea is a consortium of the mentioned nationwide TV channels (MEGA Channel, ANT1, ALPHA, STAR Channel, SKAI TV and ALTER, which has subsequently closed down). In 2009, the company carried out the first digital telecast for privately-owned nationwide TV channels.

In February 2014, Digea was granted exclusive spectrum usage rights for all nationwide and regional broadcasts for a period of 15 years, meaning that the consortium undertook the digital switchover project as a whole¹³ and it is responsible for the digital terrestrial broadcasting of all of the country's free privately-owned television stations. To sum up, currently Digea has the monopoly of the national DTT transmission in Greece¹⁴. Digea owns 6 digital multiplexes, 4 of which are composed of nationwide stations, and 2 of regional stations¹⁵.

III. FIRST RESEARCH QUESTION: HOW MANY NATIONWIDE TELEVISION BROADCASTING LICENSES SHOULD BE ISSUED?

a. The Current Greek Frequency Plan

The frequency plan currently adopted in Greece (the Current Plan) has been defined by a Joint Ministerial Decision, n. 42800, of 5th October 2012. In this decision are also described details concerning the 156 broadcasting centres and their technical parameters, such as transmission power, modulation etc.. The channels allocated for digital terrestrial transmission are within the UHF band (21 – 60). Since 2012, several amendments on the digital frequency plan have been made. By way of example, on 30 April 2012 an amendment was required, since channel 54 in allotment of zone 1 (in Evros) was interfered by emissions from Turkey. Thus, channel 54 was replaced by channel 56. In 2013, the Hellenic Telecommunications and Post Commission (EETT) launched the tender process for granting the radio-frequencies rights of use for digital terrestrial television broadcasting networks. In the beginning of the February of 2014, EETT announced that the company named “Telecommunications Services Provider of Digital Broadcasting SA” and the distinctive title “DIGEA – Digital Provider Inc” submitted the only bid and thus was granted all spectrum rights of use of national and regional coverage for 15 years (4 multiplexes for private nationwide stations and 2 multiplexes for private regional stations). Each multiplex carries a total capacity of 24.88 Mbit/s, since the System Variant chosen for the Current Plan is C3 (ITU, 2006). Consequently, the number of programmes carried by each multiplex ranges from 8 in

¹¹ Sources: Michalistic, 2013; data provided to the authors by the Greek Ministry.

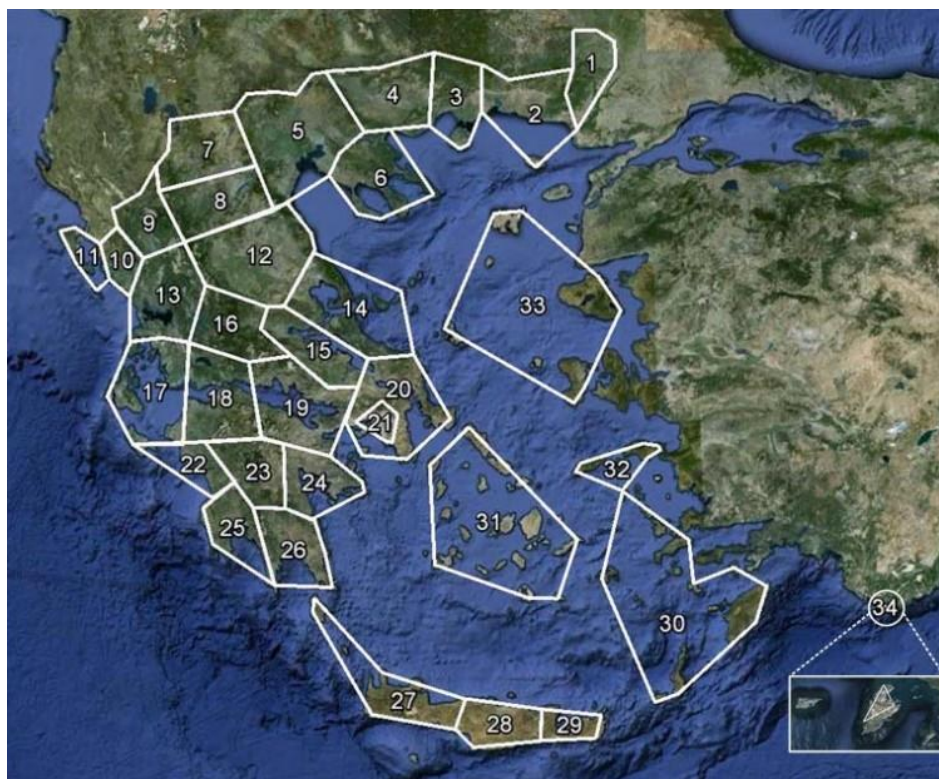
¹² Source: ESR Activities Report 2014, p. 170. .

¹³ The switchover from analogue to digital technology was successfully completed on 5th February 2015.

¹⁴ Source: Digea website, available at: <http://www.digea.gr/en>

¹⁵ Source: Digea website, available at: <http://www.digea.gr/en>

standard definition to 2 in high definition. Each national layer is composed of 34 SFN (Single Frequency Networks), each serving one of the broadcasting sections (allotments) into which the Greek territory has been decomposed by GE06 of the International Telecommunication Union (ITU) Conference (ITU, 2006).



Source: Digea

Each SFN is a DTT network that could, in principle, transmit a different programme bouquet and whose transmitters use the same frequency. The frequency used in each allotment should be one of those assigned to Greece by GE06 in the corresponding allotment. This means that, in each allotment, there should exist 8 frequencies (that can be used from both public and private network providers) assigned to Greece by GE06. Yet, it appears that this is not the case. In particular, in some allotments the Current Plan uses frequencies that have not been assigned to Greece. To be more specific, Channel 42, which was assigned to Kerkyra by the Current Plan, has been assigned by GE06 to Italy, in Puglia and Calabria, and Channels 28 and 45, assigned by the Current Plan to Pangaion, have both been assigned to Bulgaria. Finally, none of Channels 26, 29, 41 and 47, assigned by the Current Plan to the allotment of Korinthos, has been assigned to Greece by GE06. The purpose of the designers was that of co-ordinating, under Article 4 of the GE06 Final Acts (ITU, 2006), the extra frequencies (Moraitis N. and others, 2014, cit). Practical experience shows that a positive answer to a co-ordination request from a neighbouring country is very difficult to obtain. Moreover, in the case of a positive answer, it would also be impossible to obtain equal rights for the national broadcaster. The recent Italy-Malta dispute over the Maltese frequencies used by the Italian Administration shows how difficult it is to agree on co-ordinated use that is different from the plain and simple switch-off of the frequencies that interfere¹⁶.

¹⁶ See: *Times of Malta* (2013). EU unhappy with Malta's lack of progress over 4G mobile services, available at: <http://www.timesofmalta.com/articles/view/20130822/technology/EU-unhappy-with-Malta-s-lack-of-progress-over-4G-mobile-services.483139>. See also European Commission, RSPG, 2013.

b. A New Frequency Plan

The circumstance described above suggests that a New Frequency Plan (New Plan) should be adopted by the Greek Administration as a preliminary action before auctioning the new TV licenses. In particular, the New Plan should:

- Use only channels in the UHF band, as in the Current Plan;
- Use the same decomposition into 34 allotments as the Current Plan does;
- Use, in each allotment, only those frequencies assigned to Greece by GE06.

The New Plan is also crucial in order to define the maximum number of multiplexes (national layers) that the Greek Administration will be able to co-ordinate at ITU level, and hence the maximum number of multiplexes (and thus of TV licenses) that will be auctioned.

The number of frequencies usable in each allotment is determined not only by the assignments of the Geneva Conference that was held in 2006, but also by the subsequent decisions of the World Radio Conferences (WRC), which were held in 2007 and 2012, where a large portion of the UHF band (the so called 800 MHz and 700 MHz bands) was assigned, with co-primary rights, to mobile broadband (IMT) uses (WRC-07 and WRC-12). These decisions have encouraged a large proportion of Region 1 countries (Greece included) to auction off the 9 channels of the 800 MHz band (61-69) during the years 2010-2012, and some of them (France and Germany are the most notable examples) to auction off the 12 channels of the 700 MHz band (49-60) during 2015. The WRC conference, held in Geneva last November (WRC-15), has earmarked the 700 MHz band as a “worldwide band” for mobile broadband, and has decided that until 2023 the rest of the UHF band assigned to TV broadcasting (the so called sub-700 MHz band) will be left to TV broadcasting. This decision is a strong encouragement to the speedy liberation of the 700 MHz band and the repackaging of the TV broadcasting channels in the sub-700 MHz band (21-48). In fact, the use of the 700 MHz band for IMT in a neighbouring country (as in Italy or Malta or North Africa) could be made impossible by TV broadcasting use of the same frequencies in Greece. Consequently, although the right to use the 700 MHz channels assigned to Greece by GE06 is preserved and guaranteed by WRC-15, the international pressure for a simultaneous re-packaging of the TV channels in the sub-700 MHz band will certainly be very strong, also considering the 8-10 years stability of the sub-700 MHz band for TV broadcasting, which was assured by the decisions of WRC-15¹⁷. In this international scenario, it seems advisable that the New Frequency Plan should not use the 700 MHz frequencies for TV broadcasting, and that the Greek Administration should rapidly decide, in harmony with the neighbouring countries, to auction off the 700 MHz band for mobile broadband uses.

If, as suggested above, the Greek Administration should decide not to devote the 700 MHz band to TV broadcasting, the frequencies usable for the latter purpose would be those assigned to Greece by GE06 in the sub-700 MHz band. It would be (theoretically) possible to obtain, by bilateral agreements, the right to use frequencies assigned to neighbouring countries but, due to the inherent difficulties of this co-ordination process and the obvious tendency of other Administrations to keep their precious rights, it is

¹⁷ This is the direction taken, by way of example, by the European Commission. See: Results of the Lamy Report Public Consultation on 700 MHz spectrum band, 2015.

strongly recommended that the merits of a New Frequency Plan using only the channels assigned to Greece by GE06 in the sub-700 MHz band be evaluated.

The sub-700 MHz band comprises the channels from 21 to 48 (28 channels). The number of multiplexes (national layers) obtainable by the Greek Administration, along the lines described at point (b), is evidently conditioned by the allotments with the minimum number of the sub-700 MHz channels assigned by GE06. A first analysis (to be integrated into further information concerning possible bilateral agreements that intervened after 2006) shows that the critical allotments are those of Kerkyra, Pangaion and Korinthos, the first two having 4 UHF GE06 channels in the sub-700 MHz band, and the last only 3 channels. It is not surprising that the three critical allotments are exactly those in which the Current Plan uses channels that are assigned to neighbouring administrations.

There is an important technical remark to make here. The allotment of Korinthos is different from the allotments of Kerkyra and Pangaion. In fact, the latter are border allotments; they are, in other words, adjacent (the sea amplifies the interference) to the allotments of neighbouring administrations. On the contrary, the allotment of Korinthos has only “national” neighbouring allotments (see figure above, where Korinthos is labelled 19). This circumstance allows the Greek Administration to use, in Korinthos, one of the channels assigned to the neighbouring Greek allotments; for example, Channel 32, which is assigned to the allotments of Athens, Lamia and Kalamata. We are confident that the bilateral co-ordination of this “internal switch” could easily be accepted by the ITU and the neighbouring countries (considering also that the New Plan will solve the co-ordination problems with Italy and Bulgaria that are caused by the Current Plan). So, we can assume that, in Korinthos also there are 4 GE06 channels to be planned.

Coherently with the decision that the New Plan should be totally compliant with the GE06 agreement, the limit imposed by the three critical allotments forces us to plan only 4 national layers, and hence only 4 multiplexes with a national coverage. All the remaining frequencies will be usable for regional multiplexes, if and when they are needed. We strongly suggest applying a different strategy to assign regional and local licenses for regional and local programmes. Of course, the local nature of the programmes should be guaranteed, and the growth of semi-national programmes should not be allowed (broadcast in every allotment, with the sole exceptions of the critical ones).

The 4 national multiplexes (layers) of the New Plan could be designed to carry up to 24.88 Mbit/s in the current DVB-T standard (as in the Current Plan). In the future DVB-T2 standard (which is to be fully implemented by the end of this decade), each multiplex will be able to carry up to 75 Mbit/s. A programme in High Definition requires 8 Mbit/s in the current MPEG-4 coding and will require 4 Mbit/s in the future HEVC coding. This means that 4 multiplexes will be able to carry 12 National HDTV programmes with the current technology, and up to 72 HDTV programmes with future technologies, which are already scheduled for mass distribution (DVB-T2 + HEVC).

c. The Compatibility of the New Plan with the Current Situation

Are these numbers compatible with the foreseeable requirements of the Greek (content) market? Currently, as mentioned in the first part of this study, the private TV

programmes that have national coverage are eight, and namely: MEGA Channel, ANT1, ALPHA, STAR Channel, Epsilon, ART, SKAI TV and Makedonia TV. In addition, there are 3 public TV programmes with national coverage, namely, ERT1, ERT2 and ERT3. The latter programmes use 2 multiplexes. The 3 public TV programmes and the 2 related multiplexes are reserved for Public Service Broadcasting and these will not be auctioned¹⁸.

There is also a variable number of regional programmes, but we have to take into account the large number of GE06 channels that are available in each non-critical allotment.

Furthermore, the peculiarity of the Greek network of transmission system needs to be taken into due account. As seen, it appears that Greece has, at the moment, only one tower and multiplex operator (Digea), which is the common carrier of all the private TV programmes with national coverage. Digea, as we have seen, has a license over the multiplex, which lasts 15 years from the date it was granted, that is 2013. On the contrary, as mentioned, the public TV broadcaster, ERT, owns 2 multiplexes, but presently still uses the Digea network for transmission¹⁹.

Finally, as the financial data available for the period 2013-2015 are incomplete and present inconsistencies, we are unable to apply any of the standard benchmarking scenarios to define the number of licenses to be granted on financial viability grounds. Yet, as the overall financial obligations of the sector exceed the amount of 700 million Euros and the advertising revenues of the nationwide content providers have been falling in the last years²⁰, it is arguable that a contained number of licences, as derived above on technical grounds, could facilitate the economic viability of the winning operators.

d. Preliminary Conclusions

From the initial analysis, above, a few preliminary conclusions can be drawn:

- i. Before auctioning the new TV licenses, the Greek Administration should adopt a New Frequency Plan.
- ii. To be future-proof, and to guarantee the best use of resources and the healthy development of the TV market, the New Frequency Plan should only use the frequencies assigned to Greece by the GE06 agreement.
- iii. The 700 MHz frequency band could be dedicated to (and auctioned for) mobile communications, and the New Plan should use only GE06 frequencies in the sub-700 MHz band (Channels 21 – 48).
- iv. The maximum number of multiplexes assigned to Greece in the sub-700 MHz band, by GE06 agreement, is 4. 2 of them are reserved for public TV broadcasting, while the other 2 could be used for private TV broadcasting. Since a multiplex using the current technology and a robust coding scheme can carry 20 Mbit/s, and hence a maximum of 2 HD channels, the total number of

¹⁸ Data provided to the authors by the Greek Ministry.

¹⁹ Data provided to the authors by the Greek Ministry. See also chapter 2 of Law n. 4335/2015.

²⁰ Direction Business, (2014). Annual Report – Communications and Media Market in Greece 2014: Facts and Figures.

nationwide private channels that can be transmitted in Greece is 4. Considering that each license will be issued for a slot relating to one nationwide channel only, the number of licenses that should currently be auctioned by the Greek Administration cannot therefore exceed the 4.

- v. This should not exclude the possibility that, in the future, when new technologies will allow any multiplex to carry more than 2 HD channels, more licenses could be issued. In fact, the object of the license that will be granted through auction is not the frequency, but only a single programme that can be transmitted over it.

IV. SECOND RESEARCH QUESTION: WHAT SHOULD THE AUCTION'S STARTING PRICE BE?

To evaluate an *ex-ante* level for the value of spectrum, in order to acquire valid indications for a base price for an auction, it is possible to proceed in at least two different ways.

The first is to simulate the business model of a potential user of the spectrum. This procedure would require detailed information on the effective authorised use of the spectrum (length of the licenses, coverage obligation, technical conditions, and so on), but also a complete analysis of the market and of the possible sources of revenue and of other costs, except for spectrum, for the companies participating in the auction.²¹ This possibility is largely limited by the absence of reliable information based on the Greek broadcasting and advertising market. This lack of information is also a consequence of the deep shock suffered by the Greek economy in recent years, which essentially renders unreliable the use of old data sets for the estimation of future values. For this reason, we will use the limited Greek data that is available primarily as the scale element for an international comparison.

A second way is to compare the proposed use of the spectrum to be auctioned with the economic value that has resulted in similar uses in other international, economically comparable contexts. For instance, this can be done through the analysis of similar auctions, or of other forms of evaluations of the spectrum in other countries. This procedure will also require detailed information on the effective authorised use of the spectrum (length of the licenses, coverage obligations, technical conditions, and so on), so as to be able to identify comparable situations, but does not require detailed information on the economic context in the domestic market.²²

Analysis of spectrum value and international comparisons from auction results has been conducted on many occasions, but, essentially, this has been undertaken in relation to auctions dedicated to the assignment of spectrum that is to be exploited for mobile telephony.²³ However, it is well known that this type of assignment of spectrum leads to much higher revenues than spectrum that is allocated to broadcasting. These estimations are thus of little use for the purpose of the present study, if not for the methodological suggestions that one can derive from them.

Examples of auctions of DTT bands are relatively rare, as the tradition historically has been to assign broadcasting rights without the use of auctions or any other market instrument. Even in recent years, with the switch from analogical to digital transmission, while auctions have been generally adopted for assigning spectrum that has been liberated for mobile use, the necessary "re-assignments" of broadcasting rights has been often realised through the direct granting of rights or

²¹ For instance, this method was applied to Thailand's switch over to DTT, see Bohlin and others 2012.

²² An example of an econometric application of the method, starting from the U.S. 700 MHz auctions, can be found in Bohlin and others, 2013.

²³ For instance, a very comprehensive comparison was realized in 2013 for Ofcom, see Dot.Econ 2013.

by “beauty contest” procedures.²⁴ Nonetheless, several auctions for DTT rights have been realised in the past few years, and other economic considerations could allow an indirect evaluation of the value of rights to DTT broadcasting. Considering the short time available and the highly limited informational resources regarding the Greek market, to answer the second research question we have thus proceeded primarily by using the instrument of an international comparison.

In particular, considered the difficulty in finding comparable auction procedures to that proposed by the Greek Government for DTT spectrum, we have decided to integrate the international auction comparators, which constitute a direct economic estimation of spectrum value, with an indirect economic estimator. In fact, it is possible to derive a value for the spectrum assigned to broadcasting, by capitalising on the fees paid on an annual basis by the TV broadcaster to the State for the right to use frequencies that were assigned without an upfront payment. This method allows the derivation of a second, albeit less direct, estimator of spectrum value for DTT transmission rights in Greece.

We have used an international benchmarking methodology, taking into account two main benchmarking situations, and applying all of the necessary adjustments:

- a. The starting price set (and results) in recent DTT auctions in 2 other EU member States;
- b. The remuneration fee applied, on a yearly basis, in 3 other EU member States for the exclusive use of the TV programme’s license.

a. First Benchmarking Situation: The Starting Price Used in Recent Auctions

In consideration of the presence of recent DTT auctions, the case studies identified as being useful comparators are Italy and Romania. The essential facts are the following.

In February 2014, the Italian Minister of Economic Development launched an auction to grant the licenses for DTT TV frequencies with national coverage.²⁵ The licenses were issued for three lots (Lot 1, Lot 2 and Lot 3), each covering a multiplex, and thus two TV channels. The licenses’ duration is 20 years from the moment they are assigned. The prerequisites required in order to participate in the auction were defined differently for each of those Lots. TV operators who already owned more than three multiplexes were excluded from the auction.

As for Lot 3, whose license covers Channels 25 and 59 (with an estimated nominal coverage of population equal to 96.6%), the reserve price was set at 31.625.177,20 Euros. It is to be noted that this license was granted at the reserve price.

To sum up, the relevant parameters for Italy are: a license for 2 nationwide channels, for 20 years duration, with a starting reserve (and granting) price of 31.625.177,20 Euros.

Following the plan of the Romanian Ministry of the Information Society, in March 2014 ANCOM, the Romanian regulator for electronic communications, auctioned five

²⁴ For instance, Analysys Mason, in a 2012 analysis for the Greek Ministry Transport Infrastructure and Networks, suggested the rapid assignment of rights to access in the 470-698 MHz band for DTT “to accelerate the migration from analogue to digital” without suggesting auctioning these rights, see Analysys Mason, 2012.

²⁵ See the report to the Italian Senate summarizing the procedure, Senato della Repubblica, 2014.

terrestrial digital television multiplexes, four in UHF and one in VHF, in the DVB-T2 standard.²⁶

The auction ended on 10th June 2014, when ANCOM announced the end of the tender. By means of a competitive selection procedure, three national multiplexes were awarded to SNR, for 1.020.002 Euros. The reserve price for each multiplex was 300.000 Euros and two of the multiplexes were not assigned.

To sum up, the relevant parameters for Romania are: a license for 3 nationwide multiplexes, for 10 years duration, with a starting price of 300.000 Euros each, and a granting price, which was close to the starting price, of a total 1.020.002 Euros.²⁷

In order to compare this data with the Greek situation, and to be able to extract useful indications for the setting of the starting price for the Greek auction, we have considered and compared the following parameters: (i) the Italian and Romanian vs. the Greek GDP²⁸; (ii) the Italian and Romanian vs. the Greek total turnover for the TV advertising market²⁹; (iii) the Italian and Romanian vs. the Greek total turnover for the TV advertising market as a quota of the GDP. All the reference data refer to the year 2013/2014 so as to be comparable with the international auction data used as comparators.

Through considering this, the GDP of Greece as an average for the years 2013 and 2014 was 11.2% of the Italian GDP and 123.8% of Romania GDP, while TV advertising revenue in Greece was 7.2% of Italian advertising and 120,2% of Romanian advertising, we derive correction parameters for the auction in the 2 comparator countries. In practice, we assume that the correction to be applied to the Italian and Romanian values is an intermediate number between the relative shares of GDP, which represent an indicator of the potential for advertising, and the direct share of advertising, which represents the measure of the development of the TV advertising market in each country.

A linear interpolation for Italy would propose a number in the area of 9% of the value for the Italian reserve price of the assigned DTT license of 31.625.177,20 Euros. While a linear interpolation for Romania would propose a number in the area of 122% of the value of the Romanian reserve price of the assigned DTT license of 300.000 Euro. We thus derive a (rounded) number of 2.800.000 Euros from the Italian auction, and a (rounded) number of 400.000 from the Romanian auction.

However, while it is possible that other factors may have relevant influence, specific rights' assignments definitely need to be accounted for in the calculation. The Italian license is assigned for a full multiplex and for 20 years duration. Comparing this with the projected assignment in Greece, of one HD channel for each license for the duration of 10 years, with Italy there is thus a double factor of division by 2 that needs to be

²⁶ The Annual Report of ANCOM, the Romanian regulator for spectrum, summarizes the results of the procedure, see ANCOM 2014.

²⁷ For our purpose, it is interesting to notice that, for the two national multiplexes, which were not assigned in 2014, the Romanian Government is preparing a new auction, to be held in 2016, maintaining the same reserve price of 300.000 Euros, see ANCOM 2015.

²⁸ GDP data for all the countries, converted into US Dollars, are from the International Monetary Fund, the International Financial Statistics, Yearbook 2015.

²⁹ TV advertising data for Italy and Romania are taken from AGCOM and ANCOM Annual Reports. TV advertising data for Greece are taken from ESR Activities Report 2014, as well as from the Direction Business (2014), Annual Report – Communications and Media Market in Greece 2014: Facts and Figures.

applied. The Romanian license has the same length as the Greek project, that is, 10 years, but, again, it assigns a full multiplex; a single factor of division by 2 should thus be applied.

As a consequence of the characteristics of the Greek assignment, the comparable value derived from the Italian value, therefore, is around 700.000 Euros and the one derived from the Romanian value is around 200.000 Euros. In the absence of any further elements to weight these two reference points differently, we propose substantial averaging out and derive a possible auction starting price for Greece, consistent with recent DTT international auctions, in the area of **500.000 Euros**.

b. Second Benchmarking Situation: The Remuneration Fee Applied in Other Countries

In a number of countries, as we discussed above, the State does not have recourse to auctions or other market instruments in order to grant spectrum licenses to be used for broadcasting TV programmes. Rather, those kinds of licenses are attributed, under certain parameters, without any upfront payment, but with the obligation to pay an annual license fee. This method was used in the past in Italy, and it is currently used, for example, in Portugal and, in some ways, in the United Kingdom, among others. This fee, usually calculated as a percentage of the company's turnover, can be reasonably connected to the hypothetical value of the license.

In order to use this second kind of international data to procure a benchmark for the Greece auction, the method that could be applied is the following. First, to consider the value of the full annual fees paid in a country for the licenses, to multiply it by the number of years that the license is supposed to last (i.e., in the Greek project, 10 years) and to divide it by the number of channels that are covered by the licenses.³⁰ This should offer an alternative hypothetical view of the value of the single license that could constitute a reasonable reference for the auction starting price in Greece.

The first element, in the case of the Italian comparator, does not need a specific calculation, as the fee was already defined as a 1% of the revenue of all of the national TV companies.³¹ Considering the dimensions of the Greek advertising market in 2013, this percentage leads to a fee (rounded) of about 2.3 million Euros per year. If this fee is projected for 10 years, we have around 23 million Euros of payments/value. If we then divide it for the 4 HD channels for which we are suggesting assignment in answering the First Research Question, this leads to an estimated value of 5.7 million Euros.

A similar calculation, based on the numbers in the Portuguese market, would give the following results. The annual fee paid in Portugal for national transmission in 2013 was around 345.000 Euros. This was based on a TV advertising market of about 224 million Euros, leading to a percentage of about 1.5% of revenue.³² Translating this into the Greek advertising market, applying for 10 years and dividing by 4 channels, this would lead to an estimated value amount of 8.8 million Euros per single license.

³⁰ In this calculation we do not discount future fees, on the hypothesis that present interest rates are particularly low and, anyway, these kinds of fees are often adjusted by States to maintain the constancy of the real value.

³¹ The fee was first established in 1999, by Law n. 448/99 and was confirmed by subsequent legislation, until the auction results cited in the previous section were assumed as reference points for newly defined annual fees, starting in 2015.

³² The information regarding the Portuguese market was taken from the Entidade Reguladora para a Comunicação Social, www.erc.pt.

However, if the same calculation were applied using a UK comparator, it would produce a widely different result. In the UK, terrestrial television companies have traditionally paid a very low fee for the use of spectrum. Notwithstanding the intention of Ofcom to move to Administered Incentive Pricing (AIP) methods to price the use of spectrum more efficiently in the future, at present, a calculation of a percentage of 0.25% of advertising turnover is probably the upper boundary of the average fee paid in the UK.³³ Using a similar parameter, the translation on the Greek market would suggest a fee (rounded) of about 0.6 million Euros per year. If this fee is then projected for 10 years, we have around 6.0 million Euros of payments/value; we then divide for the 4 HD channels to be assigned, which leads to an estimated value per license of 1.5 million Euros.

In the absence of a specific indication to weight this differently, one could combine the indications of the three different comparators, Italy, Portugal and the UK, in a simple average, which would lead to an indicative value of around **5 million** Euros, based on an average (rounded) fee of 0.9% of advertising revenue.

However, this result would only represent an indicator based on an average ability to pay in comparator countries. A parameter that it is probably not particularly adapted for use as a starting price for an auction, which should consider a more “marginal” ability to pay, i.e., the ability to pay of the likely first “excluded” company. To take this important factor into account, one could apply the parameter that is derived by the international comparison, an ability to pay of 0.9% of advertising revenue, to the fifth company of the Greek market in 2013. In theory, this company could represent the fifth ability to pay, i.e., the first company excluded by an auction that could assign a maximum of 4 licenses. In this case, considering a realised advertising revenue of around 25 million Euros in 2013, one obtains a “marginal” willingness to pay result of 2.2 million Euros.

It is possible, and maybe advisable, to combine the two indicators, especially considering that they are both based on the same international level of fees for the use of the DTT national spectrum. In fact, an indication that takes into account the general capability to pay of the market and the potential “marginal” capability could together represent a good compromise for defining a more precise auction starting price. To this purpose we could simply average out the two final results, 5.0 million Euros on average, and 2.2 million Euros at the margins, to obtain an indication of around **3.5 million** Euros as a possible base price for an auction.

c. Preliminary Conclusions

Taking into due account the limited data and the short time at our disposal, the preliminary conclusions of our analysis are the following:

- i. As we have used two alternative benchmarking methodologies, we are in a position to suggest a range of prices. Our preliminary analysis indicates that the possible starting price for each license to be assigned in the auction could be positioned in a **range from 500.000 Euros to 3.5 million Euros**. The minimum and maximum price of the range that we suggest are the direct result of the two very different methods of international benchmarking that are considered in our analysis.

³³ Ofcom’s Tariff Tables 2015/16, Ofcom, March 2015.

- ii. However, we suggest that the Greek Administration orient itself towards the lower end of the price range, rather than the opposite. In fact, a Type 1 error (that is, to set the starting price too low) could eventually be corrected by the auction's natural dynamics, considering that the law specifies that an auction raises offers. On the contrary, a Type 2 error (that is, to set the starting price too high) could lead to failure and the necessity to repeat the auction. This consideration leads us to suggest to the Greek Administration the consideration of starting the auction from a value that is comprised in an area that varies between **500.000 Euros and 2 million Euros**.
- iii. Moreover, the future auction should also consider the broader social value to Greece of granting DTT licenses. In fact, in these types of auctions, there is not only a private value to those bidding, but also a value for society as a whole. This element may assume a stronger importance if one considers that the future auction for DTT licenses in Greece, except for public broadcasting, will interest all the available national frequencies and therefore represents a central moment in terms of consumer surplus and citizens' interests in market plurality. If the Greek Administration were to attach a comparatively higher social value to the licenses than some of the benchmarked countries have, then this should impact on the recommended price. We suggest that the higher the social value that Greece attaches to the licenses, compared with the benchmarking countries, the lower the reserve auction price should be.
- iv. A further reason to orient the auction towards the lower end of the proposed range is that we suggest that the Greek Administration, differently from most of the comparators' licenses awards that we have examined, assign only specific rights for the transmission of HD channels, thus fully retaining in public hands the likely dividend from future technological evolutions.

V. CONCLUSIONS

This preliminary study aims to provide an answer to two major questions concerning the forthcoming DTT auction in Greece, that is, what should the number of licenses to be auctioned be, and what should the initial reserve price for starting the auction be? The analysis is based on the information provided by the Greek Ministry, as well as on that information gathered through research on publicly available documents and data (in the latter case, the source is duly indicated).

Among other items, the study refers to the international framework and to experience on the relevant subject. In particular, for the first research question, it takes into utmost account the ITU framework for DTT broadcasting. For the second research question, it has recourse to a comparative analysis of the present and past experiences of 4 other EU member States.

The study's reasoning and rationale considers, to the extent allowed by the available data, both public interests and the viability of the companies that will purchase the license, given the financial data relating to the Greek advertising market, which will provide the vast majority of the television stations' income.

The preliminary answer to each research question is provided at the end of the relevant parts of this study. Here, it suffices to recall that, as for the first question, we believe that the number of licenses that should currently be auctioned by the Greek Administration should not exceed the number of 4.

In any case, we strongly suggest the Greek Administration adopt, before the auction, a new frequency plan, which, in order to be future-proof, guarantees the best use of resources and the healthy development of the TV market, should only use the frequencies assigned to Greece by the GE06 international agreement. As for the second question, the reserve price from which the auction could start, we have identified, on the basis of international comparators, that each license be assigned with a possible value range that is from 500.000 Euros to 3.5 million Euros. However, for the reasons explained in Part IV of this study, we recommend the Greek Administration consider starting the auction from a more conservative value in an area that is between 500.000 Euros and 2 million Euros.

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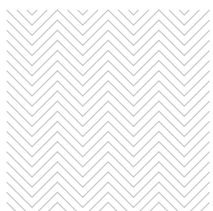
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