

USE OF AUCTION-BASED METHODS FOR THE ASSIGNMENT OF FREQUENCY BANDS TO THIRD-GENERATION NETWORK OPERATORS

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Introduction

Economic methods of managing the use of the radio-frequency spectrum provide national spectrum management bodies with new means of enhancing the effectiveness of spectrum use, assigning frequency bands for the most advanced radio technologies, satisfying the greatest possible number of operators, ensuring flexible spectrum management under market conditions, as well as receiving additional financial resources from the various communication network operators for use of the national natural resource that is the radio-frequency spectrum.

As a means of assigning frequencies to national operators, the auction is a market mechanism comprising all of the organizational and legal procedures that serve to:

- determine the market price for use of a specific portion of the radio spectrum based on the current demand by potential spectrum users;
- confer the right to use the spectrum and provide the specific types of communication service laid down in the licence.

An auction-based approach involving competitive bidding makes it possible to determine more accurately the market price of the spectrum on the basis of the expected benefits to be derived from its use. Spectrum auctioning is one effective means of granting operators the right to use the spectrum.

This paper is devoted to the legal and organizational aspects of auctioning and to the experience of using auctions in the granting of licences to operators of third-generation (3G) mobile communication networks.

1 Analysis of licensing and frequency band assignment

Let us look at the most important principles and methods that are used in both the Russian and foreign telecommunication sectors in the granting of licences for the use of specific portions of spectrum. The market approach to spectrum allocation has both its advantages and disadvantages. In reality, if what is wanted is an equitable allocation of spectrum, economic methods of managing spectrum allocation can have more significant advantages than administrative methods. The various methods of licensing and assigning frequencies are shown in Figure 1.

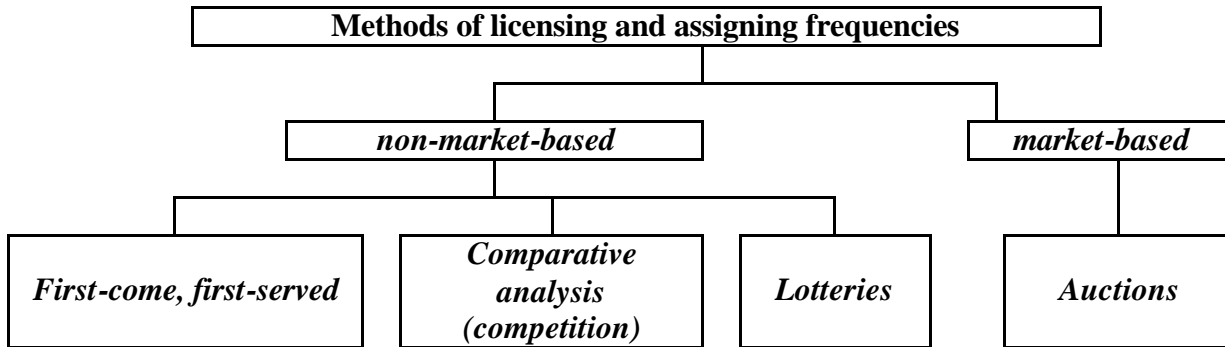


FIGURE 1
Methods of licensing and assigning frequencies

The first method - **first-come, first-served** - is based on a simple criterion whereby processing takes place on the basis of the order in which radio-frequency applications are received, this method having been typical of the early stages of development of the telecommunication market, when a major part of the resources was as yet unused or had not been licensed.

This method presupposes that as many licences will be issued as there are applicants, the limit to the number of licences granted being created by the capacity of the frequency range in question. The radio-frequency application must meet the main conditions laid down by the national regulatory body in terms of radiated power, interference levels and electromagnetic compatibility of the radio facility. The shortcomings of this method include the fact that it is unacceptable within the context of a limited frequency resource, since only the first applicants will be granted the possibility of using the licensed frequency range.

The second method - **comparative analysis (or competitive selection)** - is a method whereby notices are examined on a competitive basis prior to the granting of licences. This method will hereinafter be referred to by the word "competition".

The third method involves the use of **lotteries**. Until 1989, the United States used lotteries as the standard means of conducting the business side of allocating spectrum for cellular communications. The only dues collected were those in respect of participation in the lottery. The United States Government adopted this method in the early 1980s on the grounds that it made for rapid decision-making in the area of licensing, given that competitions were both public and very costly. Lotteries guaranteed quality and transparency for a minimal outlay, since political preferences played no part in the process.

The disadvantages of this method include the possibility that licences may be sold on for speculative ends.

The fourth method - **action** - involves the sale by auction of operator licences, and is aimed at deriving the maximum economic benefit for the telecommunication administration (government).

There are two approaches to determining the rights of the winning operator in an auction. Those rights can either relate to use of the spectrum or to the management of its use. In the first case, operators are granted the right to use the band that is assigned to them in accordance with the technical conditions set forth in the licence for the provision of services of a particular type. In the

second case, an operator to which spectrum usage management rights are granted has broader powers, being able, for example, to select the standard of the equipment used, carry out frequency planning and transfer a part of the band in question to other operators.

Examples of the use of the various economic methods of spectrum management in different countries are shown in Table 1.

TABLE 1

Country	Payment required for spectrum use	Possibility of reselling spectrum usage rights	Right to manage spectrum usage	Use of auctions
Australia	Yes	Yes	Yes	Yes
United Kingdom	Yes	No	No	Yes
Canada	Yes	No	No	No
New Zealand	No	Yes	Yes	Yes
Russia	Yes	No	No	No
United States	Yes	No	No	Yes

2 Auctioning principles and procedures

The key reason for licensing spectrum by means of auctions is neither political or social, but economic, i.e. producing the maximum possible income for the telecommunication administration (government), as well as:

- ensuring that the demand for spectrum for the development of investment-attractive communication technologies exceeds the supply;
- meeting the need for flexible spectrum licensing;
- catering for the possibility of repeated use of the frequency resource.

For the purposes of an auction, the radio-frequency spectrum is considered to be a national natural resource, and spectrum resources are granted to the highest bidder. In order to create a fully open market and increase licensing flexibility, some countries permit trading in licences that have already been granted, which introduces a certain element of "quasi-possession" into the area of frequency allocation. The purpose of this is to create a secondary market for licences, the holders of which can sell the rights to use the resources. Some countries, for example Australia and New Zealand, have been using this method since 1989. Many national regulatory bodies within Europe use auctioning, although some of them do not support the right to resell licences in view of the potential risk that this entails for end users (network subscribers).

The economic motivation for the holding of an auction resides in the fact that the more an operator is prepared to pay for a licence, the more effectively it will operate under the supervision of the national regulatory body.

Auctions have the following advantages:

- 1) Licences are granted to those participants who set the highest value on them.
- 2) Auctions bring in revenue for the telecommunication administration and require expenditure on the part of those who derive direct benefit from use of the spectrum.
- 3) Auctioning procedures are both clear and transparent.

- 4) Auctions are characterized by the objectivity and speed of licence allocation (frequency assignment).
- 5) Auctions serve to reduce administrative protectionism and corruption in the competitive struggle for spectrum.
- 6) Auctions give a more accurate reflection of the demand for and price of a given portion of spectrum.
- 7) Auctions serve to stimulate investment and facilitate technological development.

Auctions have the following drawbacks:

- a high level of initial investment;
- the risk of market monopolization and a reduction in project profitability, which in turn will dampen the desire of numerous potential investors and operators to participate in the market;
- the possibility that the licence will be subsequently resold, since licences are becoming a saleable item for the government;
- the arrival of foreign investors with considerable financial muscle.

A telecommunication administration wishing to auction spectrum may choose from among the following well known types of auction:

- English auction;
- first-price sealed-bid auction;
- second-price sealed-bid auction;
- Dutch auction;
- simultaneous multi-round auction.

English auction

- the starting price for the portion of spectrum is set by the telecommunication administration and the bidding begins from that price;
- the portion of spectrum is awarded (i.e. the licence is granted) to the bidder having offered the highest price;
- bids continue to be accepted until the point at which no more bids are forthcoming;
- each participant is fully informed about the bids made by all other participants;
- the auction finishes when only one participant, having made the highest bid, remains.

Dutch auction

- the starting price for the portion of spectrum is set by the telecommunication administration at such a high level that no one will be prepared to buy;
- the selling price is gradually reduced until such time as a buyer makes its claim;
- participants do not have full information regarding the buying intentions of other participants;
- participants do not have information about each others' bids.

First-price sealed-bid auction

- participants indicate the size of their bid for the portion of spectrum under auction in sealed envelopes;
- participants have no information about the other bids made since all bids are handed in at the same time;
- the winning bidder will be the one offering the highest price;
- the winner pays the auctioneer the sum indicated in its bid and receives the portion of spectrum in question.

Second-price sealed-bid auction

- participants indicate the size of their bid for the portion of spectrum under auction in sealed envelopes;
- participants have no information about the other bids made since all bids are handed in at the same time;
- the winning bidder will be the one offering the highest price;
- the winner pays the auctioneer a sum corresponding to the size of the bid placed by the participant having come second in the bidding.

Prior to the holding of the auction, those intending to participate must have full information regarding the degree of protection from interference in the portion of spectrum in question as well as the measures to be taken by future operators to prevent interference from being caused to other radio services. The telecommunication administration must guarantee protection from interference in the portion of spectrum covered by the licence. The quality of the telecommunication administration's frequency assignment database and the administration's ability to carry out spectrum monitoring and impose punitive sanctions on other spectrum users producing interference are factors that have a bearing on the success of spectrum auctions.

Time-frame for the holding of an auction

The procedure for conducting an auction in the United States takes the following form:

- 180 days prior to the date of the auction: information is published on the frequency band and on the conditions pertaining to the licence to be auctioned, the content of the application, selection conditions and initial bidding price;
- also 180 days: a special commission is set up to handle the preparation and conduct of the auction. It includes spectrum management experts, legal specialists and economists, and performs the following functions:
 - conducting an economic and technical analysis of the existing and potential uses of the bands to be auctioned;
 - evaluating the potential market value of the auctioned assignment and determining the minimum bid price;
 - selecting the type of auction and method of payment;
 - effecting a preliminary selection among those intending to participate in the auction;
- 120 days: a survey is published with a view to gathering views and suggestions from potential participants in the auction on all the technical and economic aspects thereof;
- 90 days: all potential participants are provided with fully detailed information on the auction procedure;
- 45 days: a seminar is held for potential participants;

- 30 days: cut-off date for the acceptance of requests to participate;
- 23 days: announcement of the results of the selection of potential participants, i.e. publication of the list of all those authorized to participate in the auction;
- 16 days: all intending participants must pay their registration dues;
- auction day.

3 Characteristics of auction-based methods of licensing and frequency assignment

An auction is a market mechanism, and the main prerequisite for its due implementation within any market is compliance with the relevant legal provisions of the national legislation. This means, first and foremost, that an appropriate regulatory and legal basis must be established for the holding of auctions for the licensing of spectrum for specific broadcasting services. Secondly, prior to the holding of auctions, conditions must be drawn up in respect of the licences to be granted by auction and the rights of their recipients (geographic scope, bandwidth held, ownership of licences, etc.), as well as the responsibility of the licence-holder (service restrictions, equipment standards, etc.) to be included in the licence conditions. Furthermore, licence-holders must be sure, when benefiting from the rights and privileges accorded to them by the telecommunication administration, that they are at the same time meeting the various conditions to which they are bound. Any uncertainty as to those conditions, particularly in such areas as the period of validity of the licence granted by means of auction, will impair the effectiveness of the auction procedure by reducing the number of potential participants, and hence significantly reduce the amount of revenue received by the telecommunication administration.

When organizing auctions, it is important that the telecommunication administration's requirements be transparent and that there be timely access to all available information concerning the spectrum resource to be auctioned, in order to avoid situations in which the highest bid overestimates the benefit to be derived from the acquired resource.

Governments and national regulatory bodies are faced with a very difficult task when it comes to granting licences by means of auctions: first, they must take care to avoid the creation of monopolies or dominant positions, and second, they must not permit speculative dealing, particularly where an operator does not use a given part of the spectrum it has received.

For example, it is quite probable that prices on the spectrum market will from time to time deviate from the licence fee established by the national regulatory body. This can occur as the result of an insufficiency of frequency bands, of changes in the price of spectrum as a result of technical or market developments, or indeed of changes in the frequency allotment policy.

Finally, there is also the possibility that speculators will come onto the market in order to acquire a frequency range with the intention of raising its value. In accordance with economic theory, speculation in a given commodity is not necessarily a bad thing, and may even turn out to be advantageous. As a rule, speculation on the spectrum market is a result of its improper allocation and may lead to major costs as a result of the failure to use alternative possibilities. Nevertheless, the fact that a given frequency range is not used may represent an obstacle to new market entrants and result in economic losses due to the absence of revenue.

For these reasons, a careful analysis based on specific examples should be carried out prior to choosing the auction as the licensing procedure. Auctions should not be held in the absence of competing candidates, since there are no economic grounds for holding an auction where there is only one bidder.

In European countries, moreover, auctions are currently permitted only in cases where the spectrum in question is to be used for specific radio services. Furthermore, auctions may give rise to problems in the case of services which have a major economic impact when implemented on a large scale and for which licences of a transnational character need to be obtained in order to achieve that economic impact. If, for the purposes of coordinating or holding a joint auction, it is necessary to establish or select an international organization, the licensing process can take a long time. However, this does not mean that the use of auctions should be ruled out, but rather that their use should be considered alongside the available alternatives.

In the first case, operators are granted the right to use the band that has been assigned to them in accordance with the technical conditions laid down in the corresponding licence for the provision of specific types of service. For Russia, this is similar to making a licence to operate in the field of telecommunications available for sale by auction. The difference between a licence to use the spectrum and the standard type of authorization to use frequencies, which is currently applied in most countries of the world, lies in the fact that the operator is entitled, over a given period of time, to sell or transfer it either wholly or partially, subject to compliance with the stipulated technical restrictions. In Russia, the granting of such a possibility to an operator having received its licence by means of an auction is conducive to future development, since a new operator may introduce emerging high-performance technologies or equipment by agreement with the existing operator, without waiting for the licence period to come to an end.

In the second case, an operator that has been granted rights to manage spectrum use acquires broader rights, such as the right to select the standard of the equipment used, carry out frequency planning and transfer a part of the band it uses to other operators. The technical conditions laid down in such a licence must require the operator to ensure electromagnetic compatibility between its system and other radio systems, and must make it binding upon the operator to comply with the provisions of the Radio Regulations, the international commitments of the national telecommunication administration, the national table of frequency allocations and all other relevant national regulatory texts. For the Russian Federation to adopt such liberalized operating principles for the radiocommunication market at this time would be premature, since the conditions for such a reform are that a country should have well-established and mature market relations, a modern State system of spectrum monitoring and standardization, a national frequency assignment database, as well as the absence of any need for cross-border coordination between countries, as is the case with New Zealand and Australia.

It is impossible to propose a universal method for determining the initial bidding price, which will depend on a large number of parameters, chief among which is the interest to investors of introducing a given communication or broadcasting technology. The telecommunication administration must develop criteria for determining this value. The choice of criteria will depend on the technology policy which guides the telecommunication administration in its activities, for example: enhancing the efficiency of spectrum use, creating economic incentives to promote the use of higher and less congested frequencies, pursuing a preferential tariff policy for low-income social groups or the disabled. In some cases, it also has to be borne in mind that the introduction of new, forward-looking radiocommunication systems will require the availability of resources to withdraw the existing radio services from the bands in question.

Conducting spectrum licensing auctions can lead to the establishment of monopolies and growth of speculation - a situation that is considered to be one of the main drawbacks of the auction-based method of assigning frequencies. Firms wishing to introduce new technologies but not having much in the way of start-up capital will be unable to raise the auction price of the spectrum they require. For this reason, auction participants must undergo a preliminary selection process.

A country's anti-trust legislation is one of the most important State principles in favour of the normal conduct of auctions. Another means of enabling firms having little in the way of start-up capital to obtain a licence is to allow them to spread their payment of the auction price over the entire period of validity of that licence, taking into account the rate of inflation. One option in the fight against monopolistic practices could be to make the bidding price a percentage of the revenue that will serve to determine the volume of the yearly payment for the licence.

One of the key instruments in ensuring the effective use of spectrum obtained through winning an auction is to establish a deadline for the commencement of service provision ("use or lose"), thereby ensuring that portions of spectrum are not acquired merely in order to be kept in reserve as a means of staving off the competition.

4 Experience in the use of auctions in the allotment of frequency bands and granting of licences for 3G networks

A detailed study of the licensing process in respect of the activities of 3G network operators in the CEPT countries including Russia, and in EC member countries excluding Greece, produced the generalized results shown in Table 2 below.

TABLE 2

Auction:	Austria, Germany, Hungary, Netherlands, Switzerland, (Turkey), United Kingdom, Denmark, Belgium
Competition:	Estonia, Finland, France, Italy, Lithuania, Luxembourg, Norway, Poland, Portugal, Spain, Sweden, Czech Republic, Ireland
Undecided:	Croatia, Iceland, Russia
In Latvia, Liechtenstein and Malta, the decision was to have a single national operator.	

A study of experience gained in Europe shows that it is not possible to select a universal method for determining who will be the licence-holders for 3G systems. Thus, in twelve European countries, including Finland, the competitive method has been or will be used as the means of deciding between applicants, while in ten countries, including the United Kingdom and Germany, the auction is used. In some cases a combination of these methods is used, i.e. in the first stage, applicants are considered on a competitive basis, during which process applications are checked against the list of minimum requirements, while selection of the ultimate licence-holder from among those having come through the first stage is effected by auction, in which the evaluation is made purely on the basis of financial bids.

Whatever the method used for granting an operator licence for 3G communication networks, the most important requirements in respect of the licensing procedure and the licence itself are as follows:

- 1) determination of the number of licensees;
- 2) determination of the territory for which the licence is to be granted;
- 3) period of validity of the licence;
- 4) determining whether the candidate is concurrently holding various licences for different types of communication activity (for services on mobile communication networks and, for example, on fixed communication networks);
- 5) requirements in respect of the licensee (date of commencement of commercial network operations, percentage of service penetration over a given period of time).

In the majority of European countries, four or five national licences will be granted; in two countries this rises to six licences, with three countries granting one licence. An analysis of the time taken to commence 3G network service provision once the licence has been granted shows this period to lie between one and 1.5 years. It is a period which needs to be taken into account when drawing up a national status report on the licensing of 3G network services.

Figure 2 below is a diagram of the number of licences issued in countries which have already completed their licensing procedure.

Figure 3 is a diagram showing a percentage representation of countries' decisions as to the licensing method. It will be seen that the majority (over 45%) of those countries have opted for the examination of applications on a competitive basis.

In the interests of creating a competitive environment in the 3G market, European administrations have categorized their operators into four types:

- recognized mobile operators;
- recent mobile operators;
- "novice" mobile operators;
- virtual mobile operators.

The main strategy for 3G licensing in European countries has been to grant only national licences on principle, in order to satisfy the needs of national GSM operators, plus one licence for a "novice".

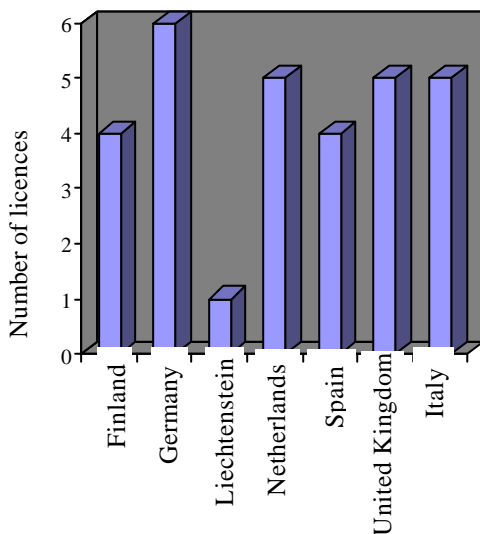


FIGURE 1

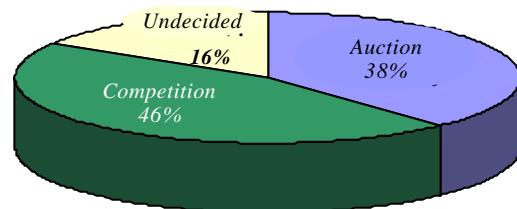


FIGURE 2

The competitive criteria for the granting of licences to "novice" 3G operators included:

- full national coverage;
- adequate financial resources;
- experience in the operation of existing communication networks;
- solid supporting evidence in the form of business plans showing the ability to provide a high-quality communication service;

- a demonstrable ability to take effective practical decisions;
- access to the existing cellular infrastructure in order to minimize the cost indices of expenditure on creating one.

Established GSM operators already have an advantage over "novices" in terms of their financial capacities and their existing conversance with market mechanisms in the operation of GSM networks and the distribution channels for the sale of their services. Such advantages make it easier for established GSM operators to set up 3G networks in Russia, although this could have a significant impact on free competition in the 3G market.

Thus, one of the approaches for determining the number of licences to be issued was the principle of the "number of national licences for 2G networks plus one licence for a "novice"".

Having regard to the experience of European countries, the use of auctions as a means of licensing 3G communication networks in Russia can be envisaged under the following conditions:

- development of a regulatory and legal basis for the auctioning of spectrum for 3G networks;
- determination of the auction procedure and carrying out of an independent legal expert analysis;
- development of principles and of a methodology for determining the starting price of a licence for a minimum configuration (2×5 MHz in a paired band and 1×5 MHz in an unpaired band), and broad public discussion thereof.

An auction should be conducted in two stages, the first of which must in all cases include a qualifying competition.

Determining the amount to be paid for a licence

The basis for determining the amount to be paid for a licence is the macroeconomic law of telecommunication development, which establishes a correlative link between telephone density within a given country and the per capital gross national product (GNP), as well as the experience of European Union experts. In addition to the GNP, we may also consider the gross domestic product (GDP), which differs from GNP in that it does not take account of products and services produced outside the national territory.

The correlative dependence establishing the link between telephone density and per capita GNP on a logarithmic scale may be expressed as follows:

$$\log N_0 = \varepsilon \cdot \log G_0 + b, \quad (4.1)$$

where

N: number of telephones within the country

P_{pop} : number of inhabitants within the country

G: GNP

$G_0 = G/P_{pop}$: per capita GNP

$N_0 = 100N/P_{pop}$

ε and b : certain constants which are dependent on the state of the country's economy and on the periodicity of comparison.

This linear dependence on a logarithmic scale is known as a Jipp diagram and is shown in Figure 3.

Telecommunications in the Russian Federation in terms of global coordinates

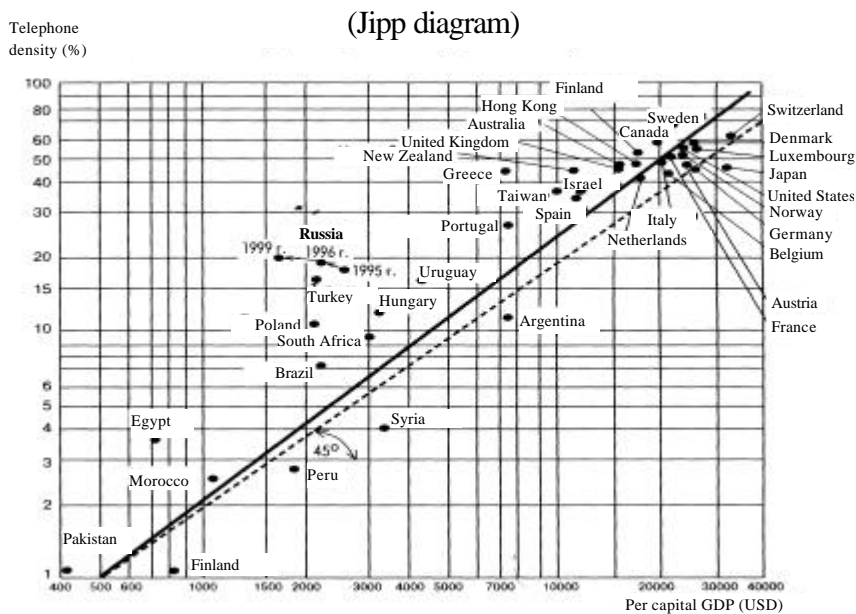


FIGURE 3

Jipp diagram

TABLE 3

No.	Country	Method of licensing	Licence fee (millions of Euros)	Per capita GNP (thousands of USD)
1	Austria	Auction	2 200	26
2	United Kingdom	Auction	42 400	22.6
3	Germany	Auction	54 900	26.5
4	Spain	Competition	(150 per year × 4)*	14
5	Italy	Auction	12 160	20.3
6	Netherlands	Auction	8 180	24.3
7	Portugal	Competition	(100 × 4)**	5.4

* Each of the four operators having received a licence must pay EUR 150 million per year throughout the period of validity of the licence (600 × 20 years = EUR 12 000 million).

** The competition-based fee for each operator is EUR 100 million plus a yearly spectrum payment that is proportional to the number of subscribers.

When determining the size of the licence fee (A_{lic}), European Union experts normally use an approach that takes account of the size of the country's population. The starting price of the licence is calculated by means of the following equation:

$$A_{lic} = P_{pop} \times \text{USD } 10 \tag{4.2}$$

However, if we look at the Jipp diagram and the information provided in Table 3, which reflects the main macroeconomic law of telecommunication development, we can see that the per capita GNP of the developed European countries exceeds the per capita GDP of Russia by at least 4 to 18 times (USD 1.4 thousand in 1999). Consequently, for the purpose of calculating the cost of licences by means of (4.2) for the most economically developed regions of the country, it is suggested that a coefficient of USD 2 per head of population is used, with USD 1 per head of population being used for all other regions, which is somewhat less than the amounts of the free-of-charge and non-repayable contributions laid down by Russian Federation Ministry of Communication Order No. 70 of 22 March 1994 in respect of regional and federal cellular communication networks.

Taking as a guide the approaches used by the European Union experts with respect to forward evaluations of the cost of licence fees for European countries in which the licensing of 3G networks has been completed, we are able to obtain the estimates shown in Table 4 and compare them with the licence fees actually received.

TABLE 4

No.	Country	Population (in millions)	Forecast licence dues (EUR millions)	Licence dues received (EUR millions)
1	Austria	8.131	97.6	2 200
2	United Kingdom	59.508	714	42 400
3	Germany	82.797	993.6	54 900
4	Spain	39.996	480	(150 per year × 4)*
5	Italy	57.634	691.6	12 160
6	Netherlands	15.892	190.7	8 180
7	Portugal	10.048	120	(100 × 4)**
<p>* Each of the four operators having received a licence must pay EUR 150 million per year throughout the period of validity of the licence (600 × 20 years = EUR 12 000 million).</p> <p>** The competition-based fee from each operator is EUR 100 million plus a yearly spectrum payment that is proportional to the number of subscribers.</p>				

A comparison between the predicted licence dues and those actually received (Table 4.4) shows the payments actually collected from the auctioning and competitive granting of 3G licences to have been 3 to 55 times higher than expected. The payments received, which reflect the true market value of the licences, exceeded the forecasts made by leading European Union economists.

The following graphs (Figures 4 and 5) were drawn up in order to determine the correlative dependence between the per capita GNP and the total licence fees received from the operating companies in each European country having completed the licensing process.

It is clear from an analysis of the two diagrams that there is no strong correlative link between them. However, in the case of Germany and the United Kingdom, both of which have held auctions, a dependence can be traced between the GNP and the payments received from auctions.

Using the proposed approach, we calculate the starting price of the licences for an auction held in the seven federal districts of Russia and for Russia as a whole.

The results of these calculations are shown in Table 4.5, an analysis of which shows that the starting price of regional licences put up for auction will lie between EUR 8.8 million (Far Eastern Federal District) and EUR 62.8 million (Central Federal District, including Moscow and the Moscow Region). The starting price for a national licence will be in excess of EUR 178 million. In calculations of A_{lic} , it was decided that the total number of inhabitants (P_{pop}) of Moscow and the Moscow Region and St. Petersburg and the Leningrad Region should be multiplied by USD 2, with the total number of inhabitants of the remaining regions being multiplied by USD 1.

A comparison of the starting prices received for regional and national 3G licences with the equivalent prices for Europe shows the Russian starting prices to be five to ten times lower than those forecast and tens of times lower than those actually received in the European context. This reflects the current situation of Russia's economy and its per capita GDP. However, bearing in mind that the speed of return on investment in 3G networks is considerably lower than for 2G networks, such one-off payments by Russian 3G operators will be matched by a considerable increase in the volume of initial investment required in 3G networks and will make 3G services less accessible to the general public in Russia.

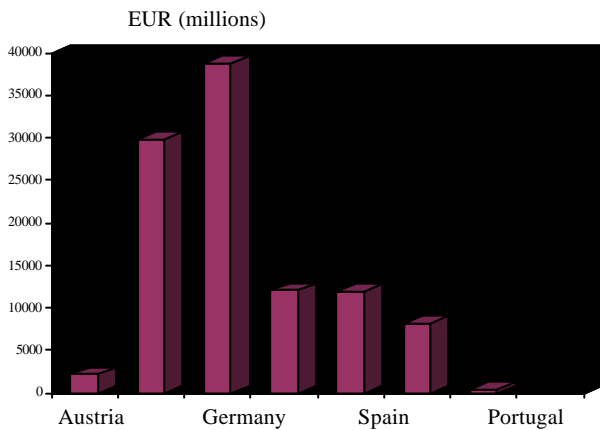


FIGURE 4

Diagram showing prices in auctions and competitions

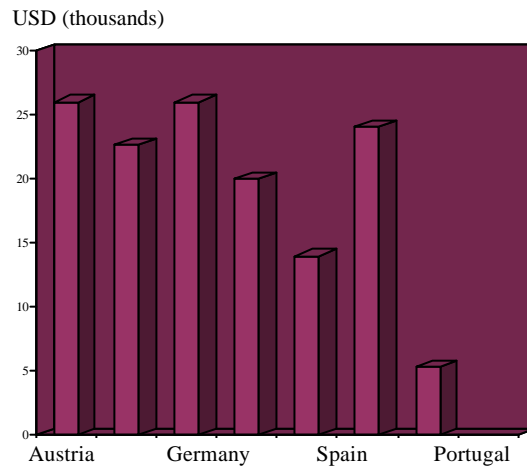


FIGURE 5

Per capita GNP

Starting prices for a licence

Germany 1 × 5 MHz: EUR 25.5 million

Austria 2 × 5 MHz: EUR 50 million; 1 × 5 MHz: EUR 25 million

TABLE 5

No.	Federal unit	Population (thousands)	Forecast licence dues in EUR (thousands)
Advanced regions			
1	Moscow province	15 040.0	36 096.0
2	Leningrad province	6 390.9	15 338.2
Federal districts			
1	Central Federal District (except Moscow province)	22 255.4	26 706.5
2	North-West Federal District (except Leningrad province)	8 342.5	10 011.0
3	North Caucasus Federal District	21 625.4	25 950.5
4	Urals Federal District	14 531.0	17 437.2
5	Volga Federal District	32 309.2	38 771.0
6	Siberia Federal District	21 267.0	25 520.4
7	Far East Federal District	7 377.3	8 852.8
National licence			
1	Russian Federation	149 138.8	178 966.6

The requirements to be met by the licence-holder are set out in the licence. Any licence issued by the Ministry of Communications of the Russian Federation must contain requirements to be met by the licence-holder in respect of:

- effective use of the radio-frequency spectrum (Mbit/s/km²/MHz);
- percentage of the population to be covered by the communication services in question (percentage of the total number);
- percentage of the territory to be covered by the communication services in question (each year);
- the date of commencement of commercial operation of the network;
- the quality of the communication services provided (error probability).

Analysis shows that a European operator having received its licence must begin the commercial operation of its network within 1 to 1.5 years and be providing 25% of the population of the region in question with communication services within the first year of operation, and 45% within the second year.

For the advanced regions of Russia, the percentage of the population covered by communication services in each year will be similar, i.e. 25% of the region's population in the first year of operation and 45% in the second, since the population density in areas familiar with UMTS is no different from that in European countries.

The minimum spectrum utilization efficiency requirements for a 3G communication network are 0.5×10^2 Mbit/s/km²/MHz.

For Russian 3G communication network operators, the maximum period that may elapse between granting of the licence and the commencement of service provision is 1.5 years.

The deadline for the commencement of service provision must be specified in licences issued by the Russian Ministry of Communications. In the event that the deadline is not met, measures must be taken with respect to the licence-holder, in accordance with the procedure followed by the Ministry in such cases. The legal mechanism for withdrawing licences has to be approved by means of a decree adopted by the Russian Government.

Conclusions

- 1 Two main methods - the auction and the competition - are used for licensing 3G network services in European countries. The decision to use one or other of those methods will be based on the level of development of the telecommunication sector, the state of the economy and the existing legal framework. To date, a majority (46%) of CEPT countries has selected the method based on competition. Over one-third of CEPT countries (38%) have opted for the auction, while the remaining countries remain undecided.
- 2 The current economic methods of managing spectrum use allow for the establishment of licence payments when selecting the spectrum licensing procedure in Russia (auction or competition).
- 3 A comparison of the forecast and actual licence dues received shows that the payments actually collected from auctions and competitions in respect of 3G licences were 3 to 55 times greater than expected. The payments received reflect the true market value of the licences, exceeding the forecasts made by leading European Union economists. The competitive payments which it is proposed to collect from competition-winning operators in Russia are five times lower than in Portugal and over 2 000 times lower than in Germany.