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V. Tikhvinsky, EMC Analysis Centre (NIIR)

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

Yerevan (Armenia)

21-23 March 2001

EMC Analysis Centre (NIIR)



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**AUCTIONING: GUIDELINES, PROCESS
AND APPLICATION FOR 3G
LICENSING**

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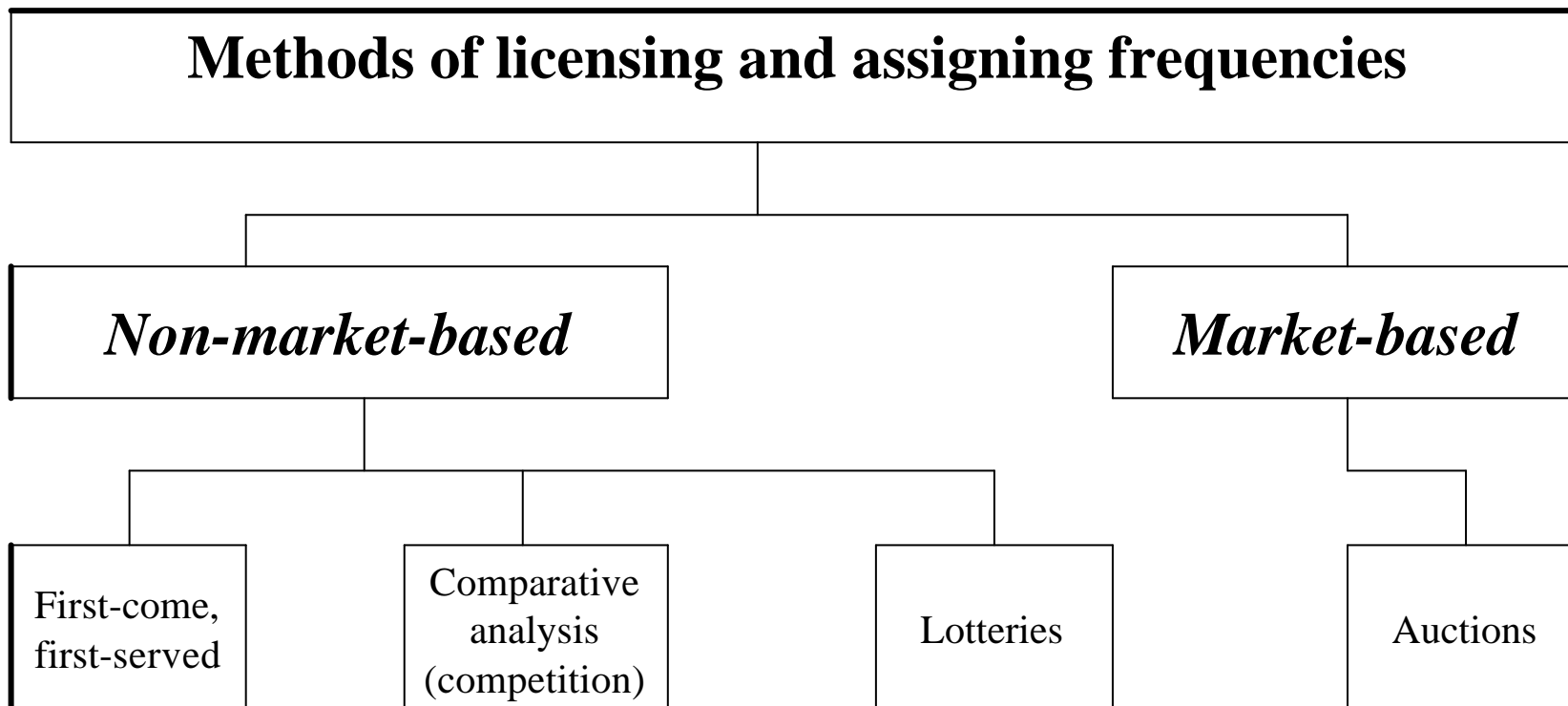


As a means of assigning frequencies to national operators, the auction is a market mechanism comprising all of the organizational and legal procedures that serve to:

- 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.



Methods of licensing and assigning frequencies





Examples of the use of the various economic methods of spectrum management in different countries of the world

| 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 |



Advantages of auctions

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 serve to stimulate investment and facilitate technological development.
7. Auctions give a more accurate reflection of the demand for and price of a given portion of spectrum.



Types of auction

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



Drawbacks of auctions

- 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.



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;
- buyers 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

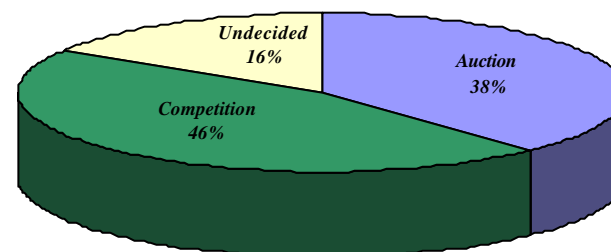
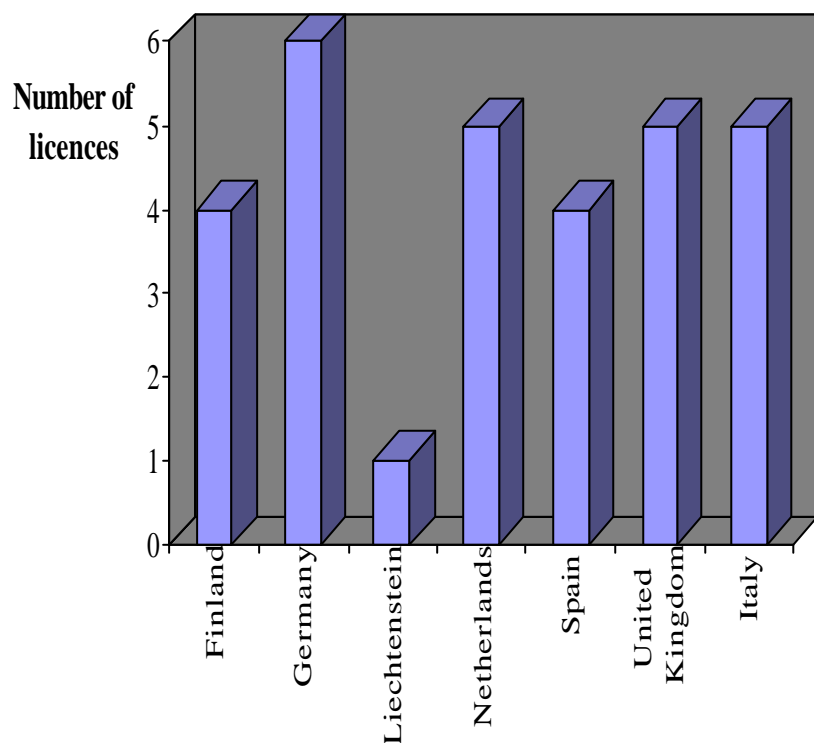
- participants indicate the size of their bid for the portion of spectrum under auction in sealed envelopes;
- participants have no information about the other bids made since all bids are handed in at the same time;
- the winning bidder will be the one offering the highest price;
- the winner pays the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



Study of the licensing process in respect of the activities of 3G network operators in the CEPT countries

| | |
|--|--|
| 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. | |

Number of licences issued in countries which have completed their licensing procedure (left), and percentage representation of European countries' decisions as to the licensing method (right)





Determination of the amount of the licence payment

| 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 x 4)* | 14 |
| 5 | Italy | Auction | 12 160 | 20.3 |
| 6 | Netherlands | Auction | 8 180 | 24.3 |
| 7 | Portugal | Competition | (100 x 4)** | 5.4 |

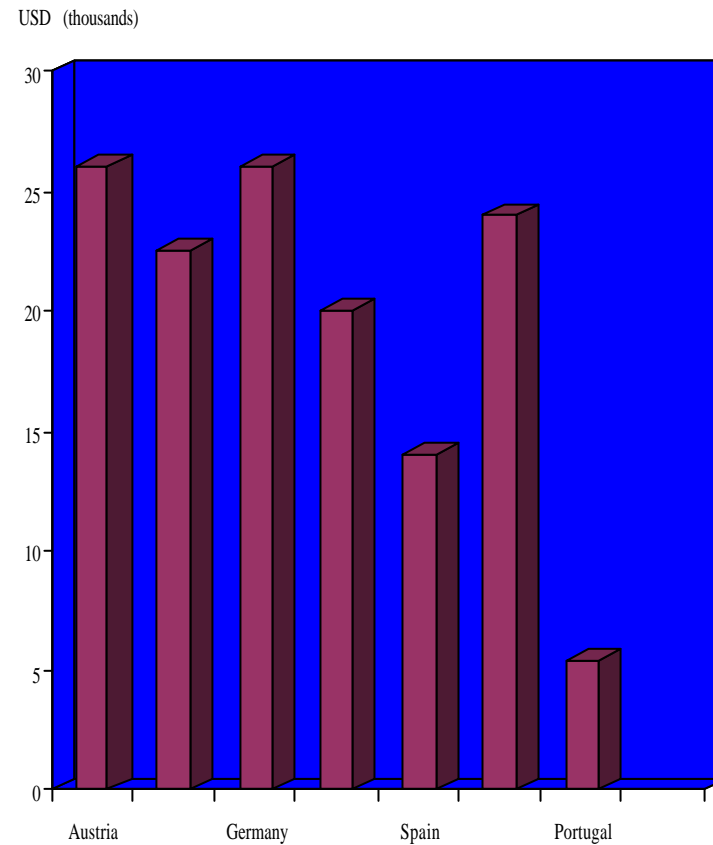
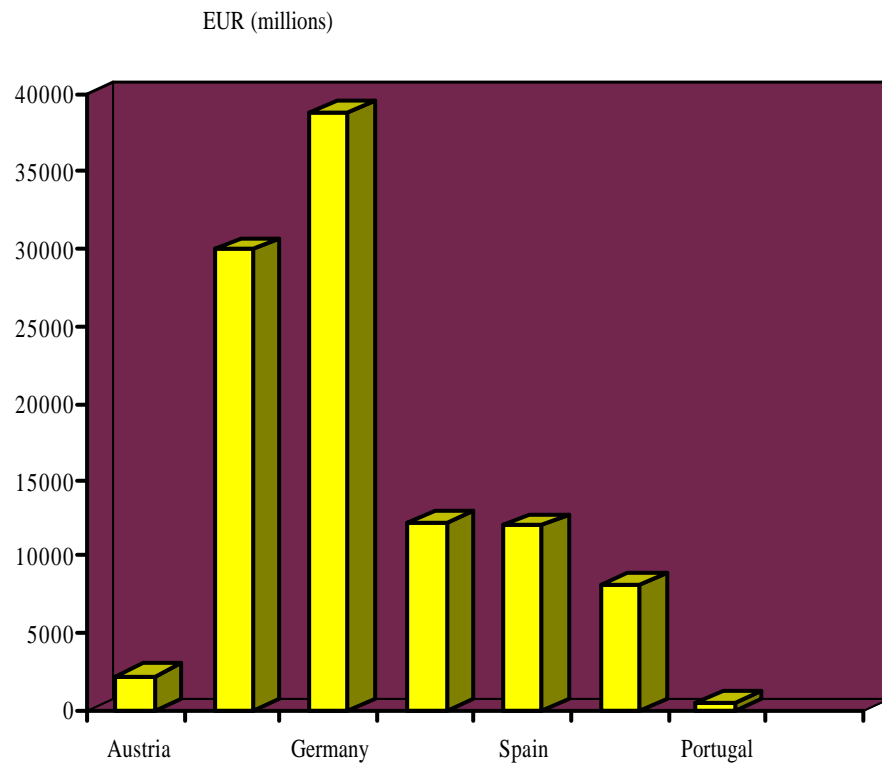


Cost of licence payments for European 3G networks

| 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 x 4)* |
| 5 | Italy | 57.634 | 691.6 | 12 160 |
| 6 | Netherlands | 15.892 | 190.7 | 8 180 |
| 7 | Portugal | 10.048 | 120 | (100 x 4)** |



Revenue from 3G auctions and competitions (left)
Per capita GNP (right)





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Thank you for your attention!

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