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Kind attention: Shri Sudhir Gupta, Advisor (MN)

**Subject: Responses to TRAI Consultation paper No. 6/2009 (16th October, 2009) on
“Overall Spectrum Management and review of license terms and conditions”
Submitted by: Dr. Rohit Prasad, Associate Professor, Management Development
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Dated: 4th December, 2009

Sir:

Kindly refer to TRAI Consultation paper No. 6/2009 (16th October, 2009) on “Overall Spectrum Management and review of license terms and conditions”. TRAI solicited comments on that paper and here is my response. As the issues appear to be interrelated I have submitted an integrated response divided into a few main sections. Apologies for the late submission. I do hope my views can be taken into consideration.

With warm regards,

Rohit Prasad

DEFINITION OF EFFICIENCY

Spectrum is a natural renewable resource. In other words it is given to us free and will exist forever. It cannot be depleted by anything that humans do, unlike fossil fuels. From a social point of view, therefore, efficient use of spectrum involves reducing the cost of all the complementary inputs that are used along with spectrum. This means principally the cost of the physical infrastructure.

The cost of the physical infrastructure is minimized if two conditions are met: a. the size of the spectrum blocks are large enough to allow the trunking efficiency gains to take full effect and b. There is enough competition to ensure operators use all measures to maximize the yield of spectrum that they possess.

MERGER/SHARING/TRADING REGIME

There may sometimes be a conflict between the two conditions required to ensure social resources are efficiently used. Given the total amount of spectrum available, the size of the block required to ensure that the benefits of trunking efficiency are fully utilized may be so large that there is not enough room for competition to ensure that each operator maximizes the spectral efficiency of the block assigned to them¹. The appropriate response in such a situation depends on whether greater harm is done by the lack of trunking efficiency or by the lack of competition.

For example, in 1995 there was only about 10 MHz of spectrum available. Therefore the benefits of trunking efficiency had to be sacrificed for the greater benefits of competition. In such a situation the government needs to step in and lay down norms like the SBN for efficient usage of spectrum, in order to compensate for the lack of competition. On the other hand, today there are 14 to 16 license holders in every circle and in the tradeoff between efficiency and competition the boot is on the other foot. Today it is important to facilitate the consolidation of spectrum in order to reap the gains of trunking efficiency, and there is no need to lay down subscriber based norms for efficient usage.

Therefore, a regime needs to be created in which the merger, trade, and sharing of spectrum is possible². This regime needs to ensure that new licensees do not make excessive windfall gains but the measures adopted to eliminate windfall gains should not be so stringent that they choke the incentive to consolidate.

PRICING OF SPECTRUM

The question arises: if spectrum is a natural, renewable resource given free by nature, then why should it be paid for by operators? The answer lies in the 'tragedy of the commons' that arises when natural resources like spectrum, oceans etc. are used without any intervention. Such resources tend to get overused resulting in fast depletion in the case of oceans or excessive interference in the case of spectrum. One solution to the

¹ Estimates on the size of the spectrum block required to reap trunking efficiency to the maximum vary from 8 MHz to 12 MHz.

² Note one is saying that consolidation should be allowed to take place if market participants desire, one is not mandating that it must take place.

tragedy of the commons in the case of spectrum is to establish property rights for a limited number of entities and stipulate power limits for transmission.

Two questions arise: how many entities should be allotted property right and who should they be? On the number of entities there are two approaches. One is to fix the minimum band for which it is *technologically feasible* to provide services and allow as many entities as can be allotted that minimum band. Further consolidation can take place through the operation of a secondary market in spectrum. The second approach is to decide some optimal number of operators through considerations of trunking efficiency and competition. Given that the first approach is likely to result in high transactions cost in terms of unnecessary build up of infrastructure, and unsettling entries and exits of operators, it is generally not considered optimal. The second approach is ideal but the problem of finding the optimal number is quite intractable.

Therefore one should fix the number of licenses at a level that is comfortably greater than the number that is required for trunking efficiency to take full effect and then select the license holders through a process of auction of the license. An auction will ensure that the entity that is best able to deliver services gets the license at a price which reflects its market value.

But charging a price for spectrum is only a means of identifying the best qualified operator. It is not defensible on any other grounds as spectrum is a natural, renewable resource. Therefore after the selection is over, some method has to be found to re-imburse the money paid for spectrum without creating a scheme in which bidders have no real cost of bidding as they know that the price they pay will be reimbursed. One way is to deposit the proceeds of spectrum auctions in the USO Fund. Since operators pay high prices for spectrum primarily for their customers in dense urban areas, this will amount to cross subsidization of rural consumers by urban consumers.

In brief, all spectrum, both startup and incremental should be awarded through an auction process in which all license holders are eligible to participate.

In the long run the only way to ensure that social resources, both spectrum and physical infrastructure are used efficiently is to ensure that the spectrum price is determined through the market mechanism. Already 3G and BWA spectrum are going to be auctioned. With refarming on the anvil, so-called 2G spectrum should also be allocated in the same manner. Treating different blocks of spectrum differently will create arbitrage opportunities.

LEGACY ISSUES

There remains a legacy issue that incumbents have been awarded spectrum on completion of SBN without an auction. The additional spectrum has attracted an additional charge in two ways. Firstly through the escalating spectrum charge and secondly through the additional subscribers that have become possible through the incremental spectrum. However to be doubly fair, the incumbents should be made to pay for all spectrum beyond the contracted amount at some market-benchmarked rate.

The subscriber based norms, necessary for ensuring spectral efficiency in an uncompetitive market should be removed. Similarly the spectrum usage charges which previously have been escalating with the holding of spectrum, in effect creating a channel for the charging of spectrum, should be removed once the full price of spectrum is charged for using the market mechanism³.

THE OPTIMAL NUMBER OF OPERATORS

While in the present juncture it is quite clear that there is more than enough competition in the market place, after the process of mergers and trades suggested takes effect, this could change. In that context the question of the optimal number of licenses, and the quantity of spectrum that is efficient may arise again.

However, again these questions should be left to market forces. Since the 1980s economists have advocated a broader view of the competitiveness of a market, beyond measures based on the concentration of market share. A market which is highly concentrated may still be *contestable* and immune to the exercise of market power if quick entry and exit is possible, customer switching costs are low, suppliers have significant power and so on.

In the telecom space contestability should be introduced by strong support to the MVNO model, mobile number portability, sharing of towers and sharing of spectrum. Also it must be remembered that very soon competition will involve multiple services being provided through multiple bands. Therefore all operators whether 2G or 3G or Wi-max, or BWA would be competing on the same turf, and competition should be defined as competition across the whole range of services. Defined in this way, there is likely to be enough competition for the foreseeable future.

SUMMARY OF RECOMMENDATIONS

1. A regime needs to be created in which the merger, trade, and sharing of spectrum is possible⁴. This regime needs to ensure that new licensees do not make excessive windfall gains but the measures adopted to eliminate windfall gains should not be so stringent that they choke the incentive to consolidate.
2. All spectrum, both startup and incremental should be awarded through an auction process in which all license holders are eligible to participate.
3. The proceeds of spectrum auctions should be deposited in the USO Fund.
4. Incumbents should be made to pay for all spectrum beyond the contracted amount at some market-benchmarked rate.
5. The subscriber based norms, necessary for ensuring spectral efficiency in an uncompetitive market should be removed.

³ There may be a concern that removing the usage charge will have negative revenue implications. That need not be the case as bidders for spectrum realizing that there is no spectrum charge will bid in higher amounts.

⁴ Note one is saying that consolidation should be allowed to take place if market participants desire, one is not mandating that it must take place.