BIF White Paper on Spectrum Issues in India

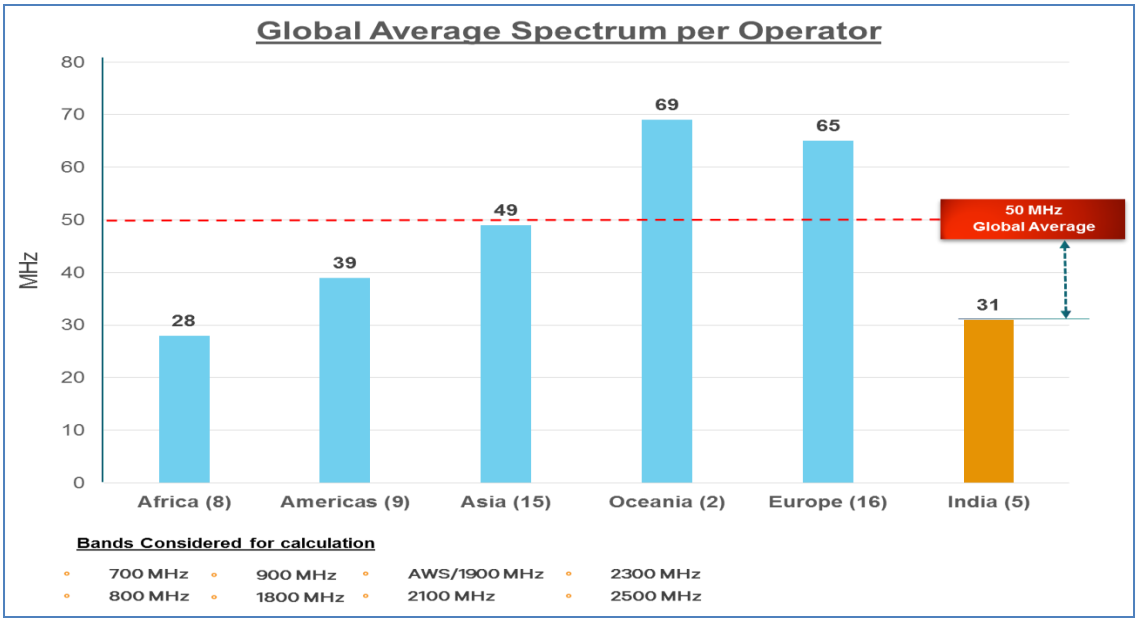
Introduction

It is widely recognized that broadband communications networks are required to support economic growth in information-based economies such as India. Spectrum is the most important ingredient of the telecom policy of a country and spectrum assignments for broadband and other services will have a crucial role to play in delivering desired broadband outcomes and achieving the objectives of Digital India.

Spectrum's greatest value comes from its usage rather than from the short-term revenues generated by its sale. Short-term revenue generation must be balanced with the subsequent infrastructure investments to be made by operators to make mobile broadband available to the Indian people. Mobile operators in India have been faced with high financial burden which, in turn, impact their ability to make the investment required to upgrade consumer services, meet demand in highly populated urban areas and, expand networks to provide coverage to people living in rural areas. At the same time, insufficient unlicensed spectrum has limited Wi-Fi and other deployments that complement carrier use of licensed spectrum.

Effectiveness of auctions held so far

Though the industry is spectrum starved but still nearly 60% of the spectrum offered in the October 2016 auction remained unsold. Even after those auctions, while India spectrum allocation has improved, it still needs an average of 20 MHz per operator to meet the current global average and is ill-equipped for the broadband era.



Indian operators have 20 MHz spectrum less than global average

In India there are many legacy issues involved with respect to spectrum which have led to a very inefficient management and usage of spectrum. The spectrum management is further getting impacted by numerous legal issues. This requires to be managed and driven by experts keeping current and future national requirements and should not be left to its fate. Also, spectrum should be utilized in the best manner possible to achieve the goals of Government's mission of "Digital India". At this juncture, there is a need to review the effectiveness of India's spectrum allocation strategy and understand reasons as why was spectrum unsold in the 2016 auction when India still has huge demand for spectrum.

The success of an auction is determined not only by the ability to sell a large proportion of spectrum up for auction, but also by the market/clearing price being significantly above the reserve price, viz. the auction process must help discover the true market price of the spectrum.

In the October 2016 auctions where a total of 2350MHz in seven bands were put up for auction in 22 circles, only 964MHz, or barely 41%, got sold. Even taking all the six e-auctions held since 2010 together, only about 60% has been sold. In the case of 700MHz auctioned in 2016, nil quantity was sold—clearly a total failure. Even for the spectrum that was sold, the price realized could not be considered the market clearing price. The average sale price was hardly 5% above the reserve price, i.e. there was hardly any market discovered price in India.

There is obviously much to be done to improve the effectiveness of our auctions and balance the socio-economic benefits over revenue maximization. BIF believes that the auction design has to change significantly before any new auction is announced.

Challenges faced by the industry

There is a need to lay down a clear spectrum roadmap and address changes related to the following:

1. Spectrum availability – including opening of broadband capable bands for provisioning internet services.
2. No transparency of spectrum assignment
3. Auction design issues

a. Low proportion of licensed spectrum sold: Except for 2010 auctions due to artificial scarcity and lack of roadmap, spectrum has remained unsold. In 2014, 900 MHz got sold 100% because of license extension/renewal compulsions. Thus, it is the artificial scarcity combined with license extension/renewal compulsions which led to spectrum sale in the initial years. In 2016, whole of 700 MHz and 60% of the total spectrum put for sale remained unsold due to unreasonably high prices. Despite the deficiency of spectrum for Indian telecom operators, only 62% spectrum put-up for auction so far has been sold indicating that Reserve Price was too high.

Low Proportion of Spectrum Sold

Year	Band	Put-up	Sold	% Sold
2010	2100 MHz	355	355	100%
	2300 MHz	880	880	100%
	Total	1235	1235	100%
2012	800 MHz	95	0	0%
	1800 MHz	295	128	43%
	Total	390	128	33%
2013	800 MHz	95	30	32%
	1800 MHz	58	0	0%
	Total	153	30	20%
2014	900 MHz	46	46	100%
	1800 MHz	385	307	80%
	Total	431	353	82%
2015	800 MHz	108	86	80%
	900 MHz	178	168	94%
	1800 MHz	99	94	95%
	2100 MHz	85	70	82%
	Total	470	418	89%
2016	700 MHz	770	0	0%
	800 MHz	71	15	21%
	900 MHz	9	0	0%
	1800 MHz	220	174	79%
	2100 MHz	360	85	24%
	2300 MHz	320	320	100%
	2500 MHz	600	370	62%
	Total	2350	964	41%
Total		5029	3128	62%

b. Few circles with premium over reserve price indicate no real market discovery: In most cases, reserve price turned out to be clearing price. Hence, there was no market discovered price. In the last auction, there were only 4 circles in 800 MHz, 6 Circles in 1800 MHz, 11 circles in 2300 MHz and 7 Circles in 2500 MHz where spectrum was sold at a premium to reserve price.

Premium Over reserve price in October 2016 Auctions

Circle	800 MHz Premium Over Reserve Price
AP	0%
Bihar	0%
Delhi	0%
Gujarat	20%
Haryana	0%
HP	0%
Karnataka	0%
Kerala	0%
Kolkata	0%
MP	0%
Maharashtra	0%
Mumbai	0%
Odisha	0%
Punjab	17%
Rajasthan	15%
Tamil Nadu	0%
UP-E	1%
UP-W	0%
West Bengal	0%

Circle	1800 MHz Premium Over Reserve Price
AP	0%
Assam	0%
Bihar	0%
Delhi	0%
Gujarat	0%
Haryana	5%
HP	0%
J&K	0%
Karnataka	0%
Kerala	0%

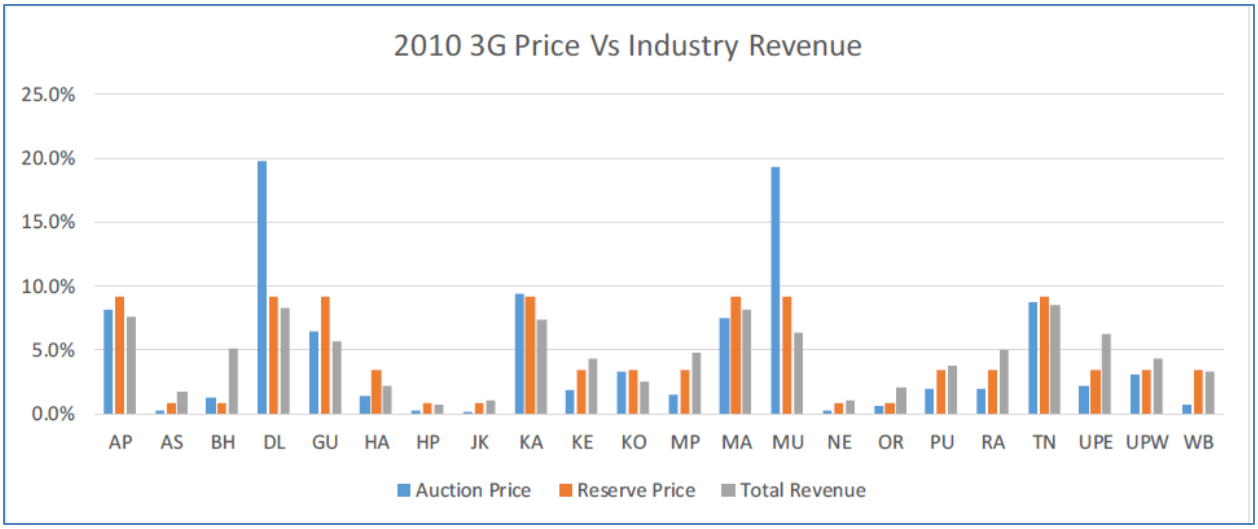
Kolkata	2%
MP	0%
Maharashtra	0%
Mumbai	65%
North East	0%
Odisha	0%
Punjab	0%
Rajasthan	1%
UP-E	16%
UP-W	5%
West Bengal	0%

Circle	2300 MHz
	Premium Over Reserve Price
AP	1%
Assam	1%
Bihar	3%
Delhi	1%
Gujarat	58%
HP	1%
Karnataka	0%
Kerala	10%
Kolkata	0%
MP	3%
Maharashtra	9%
Mumbai	0%
North East	1%
Odisha	1%
Tamil Nadu	0%
West Bengal	0%

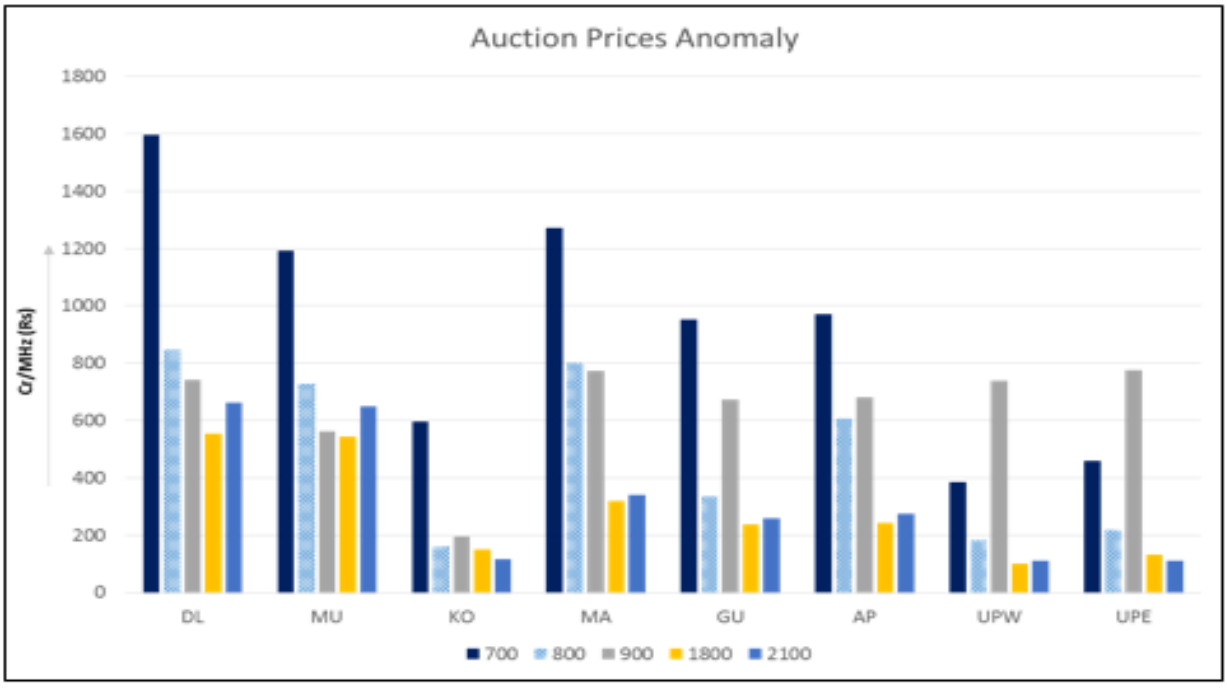
Circle	2500 MHz
	Premium Over Reserve Price
AP	0%
Assam	1%

Bihar	0%
Delhi	0%
Gujarat	0%
Haryana	1%
HP	0%
J&K	0%
Karnataka	0%
Kerala	2%
Kolkata	0%
MP	1%
Maharashtra	0%
Mumbai	0%
North East	1%
Odisha	1%
Punjab	0%
Rajasthan	0%
Tamil Nadu	0%
UP-E	1%
UP-W	0%
West Bengal	0%

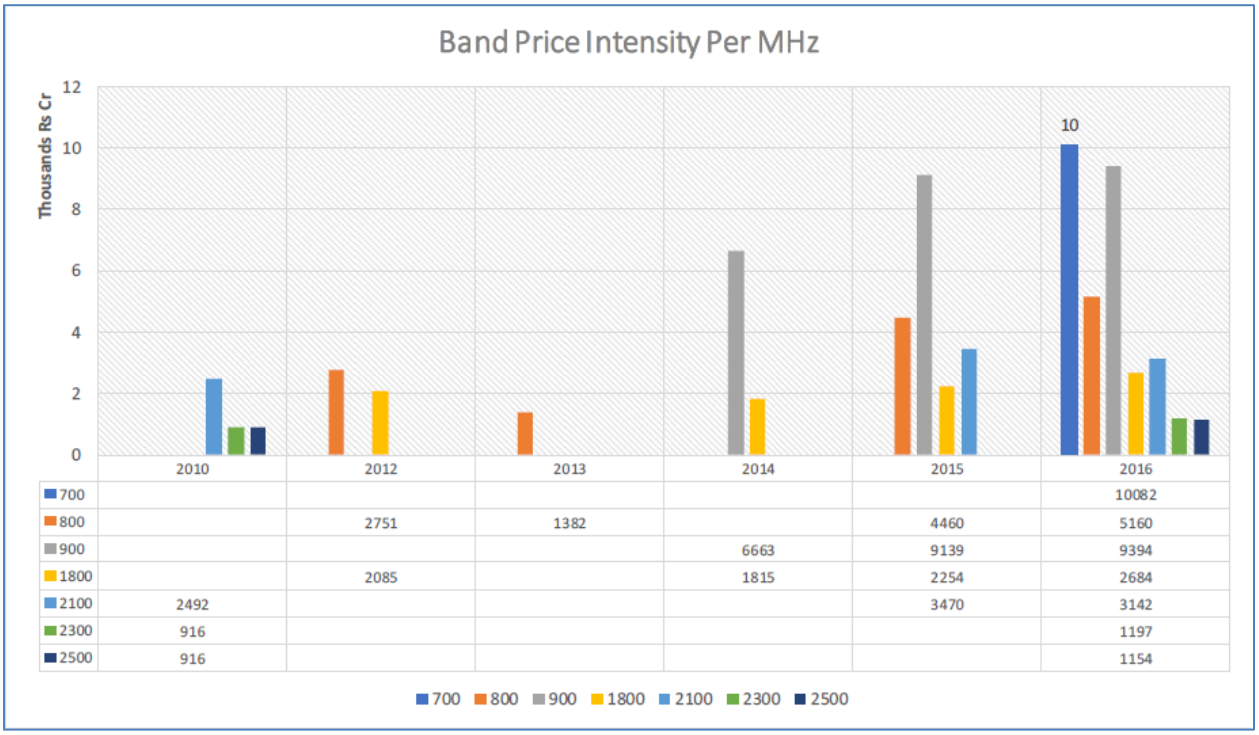
c. No correlation between prices and revenue: The value of licensed spectrum is not proportional with the market realities. There is no correlation of value amongst different bands in same circle as well as band-wise correlation amongst various circles.



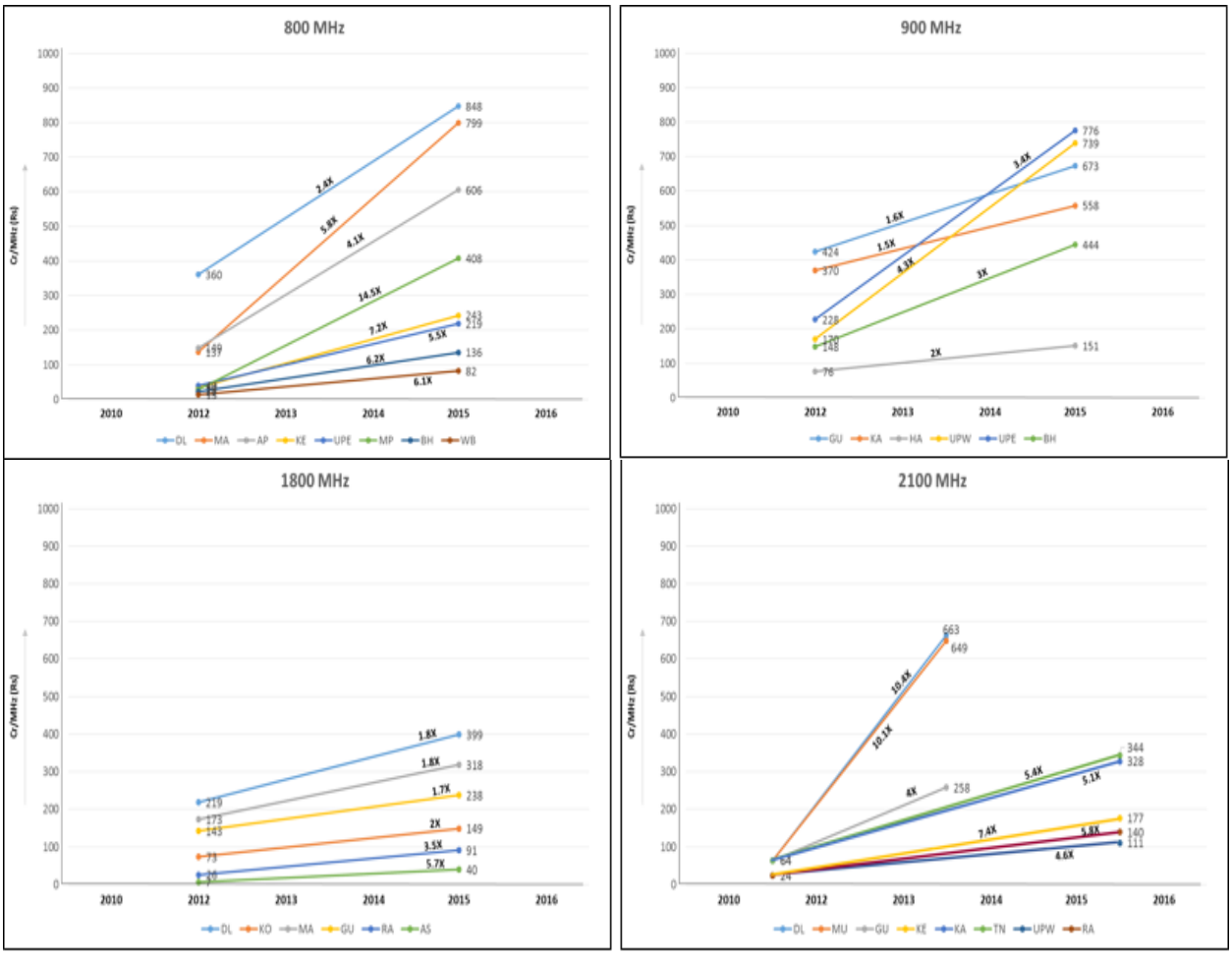
d. No correlation between price across bands: At present, the prices of lower frequency bands are not always higher. Higher revenue circles have lower prices than lower revenue circles.



e. Prices increasing exponentially: Reserve prices in various licensed bands have increased exponentially over the years over the years.



Increase in Prices of 800 MHz, 900 MHz, 1800 MHz and 2100 MHz Band



f. Anomaly in calculation (700 MHz price): A serious challenge in the last auction which did not witness any sale of 700 MHz was the reserve price of 700 MHz band, which was set at 4x of the 1800 MHz band due to a calculation error of TRAI. TRAI assumed that radio waves in 800 and 900 MHz band travelled 2 times more compared with 1800 and 2100 MHz and priced 800 and 900 MHz band at 2 times that of 1800 and 2100 MHz band. TRAI broke the logic while calculating price of 700 MHz band and linked with that of European Auctions of 800 MHz and, even so, made serious arithmetical errors in the calculation which resulted in an exorbitantly high multiplier for 700 MHz, as shown in the table alongside.

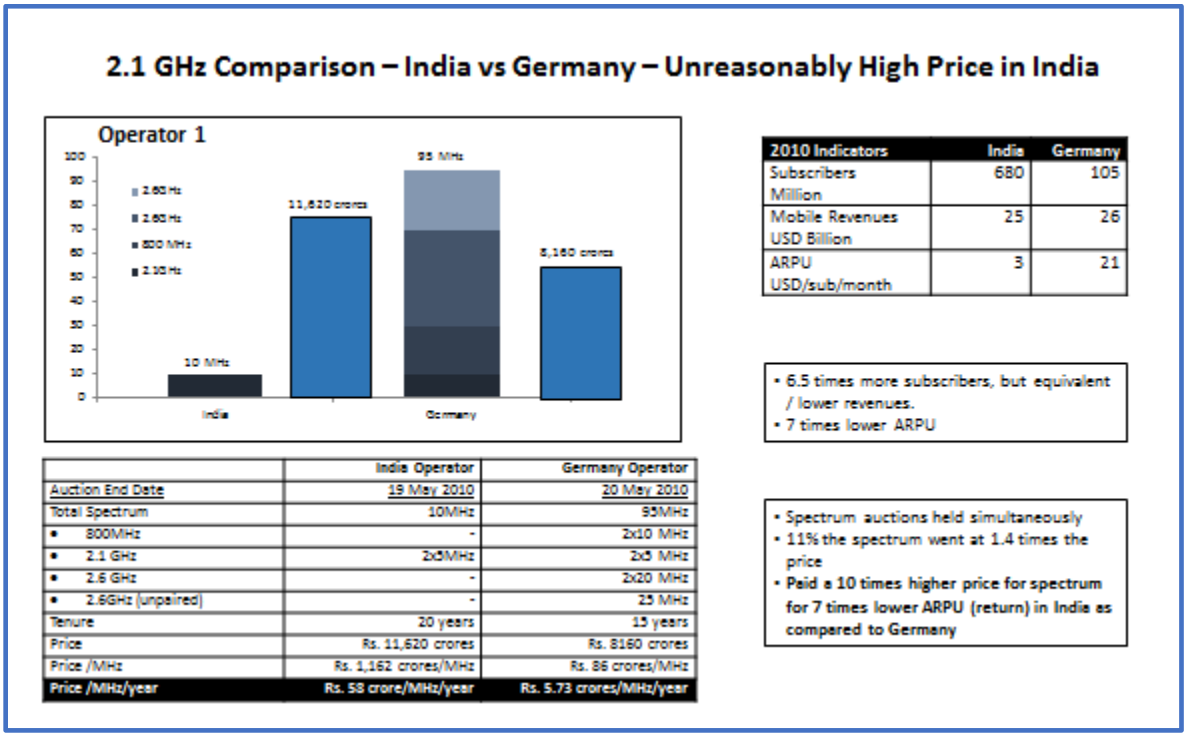
Country (£/MHz/pop)	800 MHz	1800 MHz	Ratio
France	0.5809		-
Germany	0.6217	0.0218	28.5
Italy	0.6993	0.2252	3.1
Portugal	0.3616	0.2651	1.4
Spain	0.4043		-
Sweden	0.3174	0.1788	1.8
As per TRAI : Total	**2.99**	**0.69**	**4.3**
Actual : Total (Countries with both 800 and 1800 MHz bands)	**2.00**	**0.69**	**2.8**
(-) Outlier Germany : Total (Removing Germany for real comparison)	**1.38**	**0.67**	**2.1**

The above point is borne out also by analysis of the auction results below which shows that the Indian 700 MHZ auction reserve price was effectively 46 times more than the US auction price of 600 MHz.

Parameters	**USA**	**India**	
Population (mn)	325	1,310	
No. of Subscribers (mn)*	377	997	
ARPU (USD)*	39.9	2.71	
Band	**600 MHz**	**800/1800/2100/2300/2500 MHz**	**700 MHz****
MHz	70	56	70
Bid (USD Bn)	19.77	10.17	61.84
Price/MHz (USD Bn)	0.28	0.18	0.88
ARPU Multiple (x)		15	15
Price Multiple (x)		0.6	3
Price Multiple adjusted for ARPU (x)		**9**	**46**
*Data as of 3Q16; ** Reserve Price has been taken for calculation			

It can be seen from the above that, even if 700 MHz not considered and only the other bands put up in 2016, the Indian prices are way above US levels by 9 times.

Indian price among the highest although tariffs are lowest in India: In 2010, in the 2100 MHz spectrum band, comparison with the German auction just then concluded within 24 hours of the Indian event, revealed that the Indian auction reserve prices were unreasonably high:-



India auction price was effectively 70 times more than Germany auction price

The industry has already spend total Rs. 3.5 lakh Cr (approx.) to acquire 31 MHz. The industry will have to spend additionally Rs. 13.6 Lakh Cr (at reserve price) to acquire 100 MHz additional spectrum.