



SUBMISSION TO TRAI

CONSULTATION SUBMISSION
SUBMISSION TO CONSULTATION
PAPER ON LICENCING TERMS
AND CAPPING NUMBER OF
ACCESS PROVIDERS

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Submission on licencing terms and capping number of access providers

1 Summary of the submission

The Telecommunications Regulatory Authority of India (“TRAI”) consultation paper on licence terms/conditions and capping number of access providers represents a significant milestone in terms of Indian policy framework. The liberalisation of the Indian telecommunications market has resulted in substantial growth in terms of the level of investment, the entry of new operators and the number of subscribers. This growth has necessitated a review of the policy framework in terms of:

- Number of access providers in each service area
- Terms and conditions of the access provider licence including:
 - Level of equity holding
 - Transfer of licences
 - Mergers and acquisitions
 - Permitting service providers to use a combination of technologies
 - Roll out obligations

Our response to the TRAI consultation is based on Spectrum Value Partners’ own knowledge and experience in competition and regulatory issues within the global telecommunications market.

Spectrum Value Partners has significant experience working with leading operators, regulators and financial institutions advising them on regulatory and policy issues both in India and internationally.

Spectrum Value Partners is a global management consultancy providing advice to the telecommunications and media sectors. Spectrum advises on issues including regulation and policy, strategy, product development, business development, technology strategy, implementation and change management. Spectrum has one of the largest dedicated TMT consulting teams globally, based across Asia, Europe and the Americas.

Spectrum Value Partners accepts no responsibility for how TRAI, or other parties, chooses to interpret or represent the findings of this report once it is in the public domain.

Our position on the issues raised in the consultation primarily stems from the *well accepted belief that level of competition in a market should be left to market forces unless there is a risk of abuse of market dominance*.

As a result, the regulator should not take steps that impact either increasing competition or within-industry mergers (that do not present a risk of market dominance).

Correspondingly, our argument covers the following areas:

- **Consumers nearly always benefit from higher levels of competition.** A competitive market tends to yield greater consumer benefits than a market which is a monopoly or which exhibits monopoly characteristics. Competition between operators to acquire and retain users of their products and/or services and to develop new revenue streams tends to result in declining tariffs with consequent increases in consumer surplus, as well as the development and deployment of new and/or higher quality products, services and technologies.
- It is essential for the benefit of the consumer and the industry that **the regulator takes action if there is a risk of possible abuse of market power.**

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- **Market forces are the best judge of competition** and international precedent and economic theory suggest that **regulatory intervention is needed only if there is a risk of market power concentration and subsequent abuse of market power.**
- While India is one of the most competitive mobile markets in the world, it appears that **the market will both benefit from greater competition and that it is large enough to sustain additional competition**; in any case, excess competition is best controlled by market forces rather than through regulatory intervention.
- There is a business case for **additional operators** and this **can be supported by the current spectrum availability** through technology options such as cell splitting (increasing number of BTS), using low power GSM for indoor coverage, frequency hopping and advanced coding techniques.
- Internationally, regulators have moved away from predicting the evolution of technology and if options exist for operators to choose between various **technologies this should not be prescribed by regulation.** Regulatory interventions on technology choice will impact the level of competition over time.
- **Regulatory intervention should not prevent the market from determining the level of competition** – both increasing levels of competition as well as market consolidation provided there is no risk of market dominance. Thus, if a possible within-sector consolidation is below the market dominance thresholds, regulation should not prevent it.

We have summarised our conclusions below.

1.1 Consumers nearly always benefit from increasing competition

1.1.1 A competitive market tends to yield greater consumer benefits

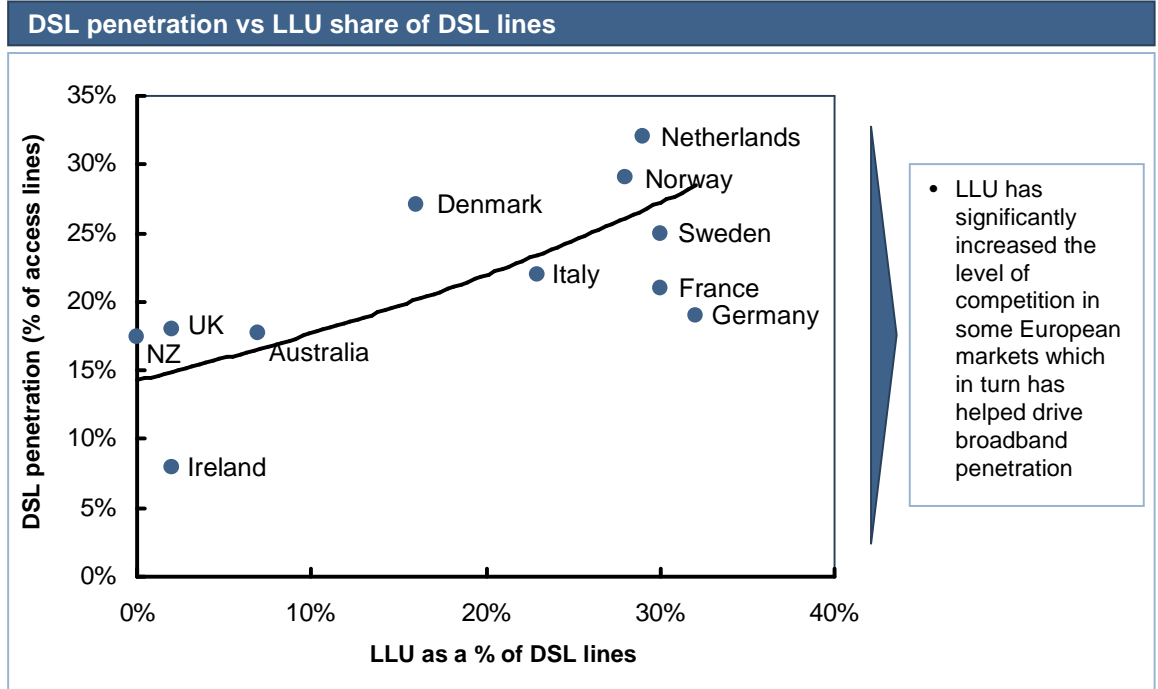
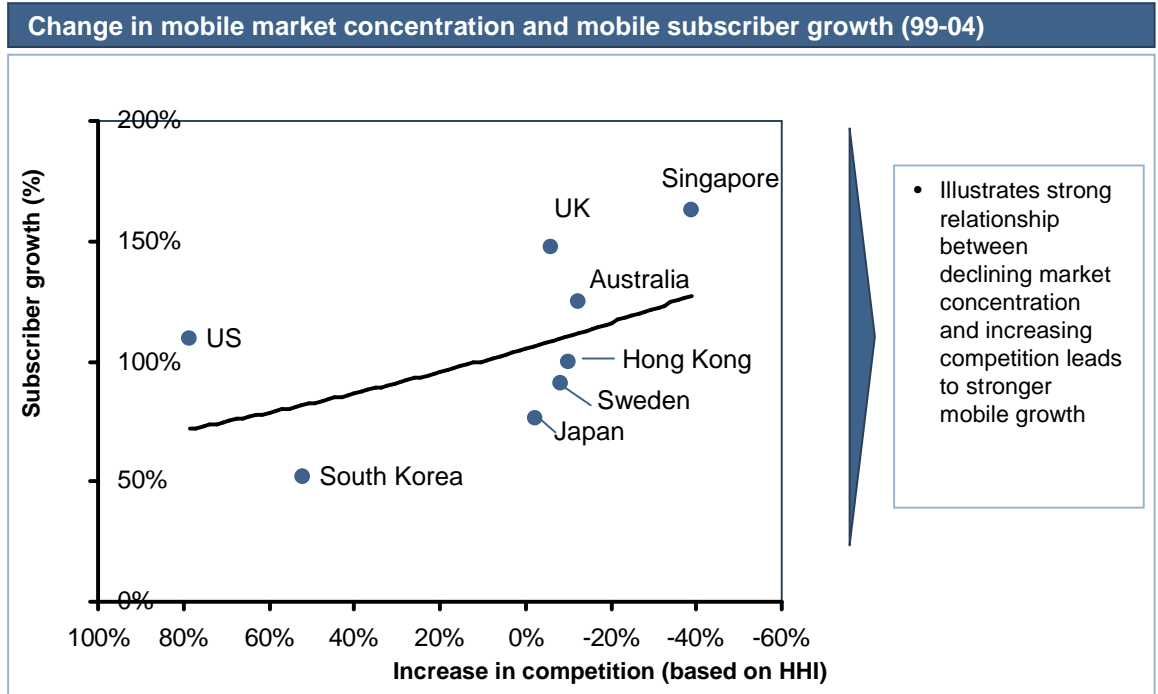
Competition is not an end in itself but a means to an end. Ultimately, the effectiveness of competition has to be judged by the consumer benefits that competition yields. There are two key variables typically used when measuring consumer benefits, namely; the take-up of the services (i.e. deployment of local fixed voice lines, the number of mobile and broadband subscribers and the available bandwidth for international services) and the relative cost of services (comparison of service affordability across markets and potential savings for consumers resulting from price trends over time).

One of the key tenets for the introduction and promotion of competition in telecommunications markets is that a competitive market tends to yield greater consumer benefits than a market which is a monopoly or which exhibits monopoly characteristics. Competition between operators to acquire and retain users of their products and/or services and to develop new revenue streams tends to result in declining tariffs with consequent increases in consumer surplus, as well the development and deployment of new and/or higher quality products, services and technologies. Furthermore, competition between operators also tends to result in the increased take-up of services as operators look to sign-up new, first-time consumers and also become more sophisticated at assessing consumer demand and adjusting pricing and packages accordingly. However, the degree to which competition leads to consumer benefits is dependent on the competitive intensity in the particular industry sector.

There is no doubt that higher levels of competition are correlated with increased rates or market penetration. This has been illustrated in both the mobile market (where increased fragmentation has led to increased subscriber growth) and the broadband market (where broadband penetration increased following the introduction of local loop unbundling).

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Exhibit 1: Relationship between competition and subscriber take up in telecommunication markets ¹

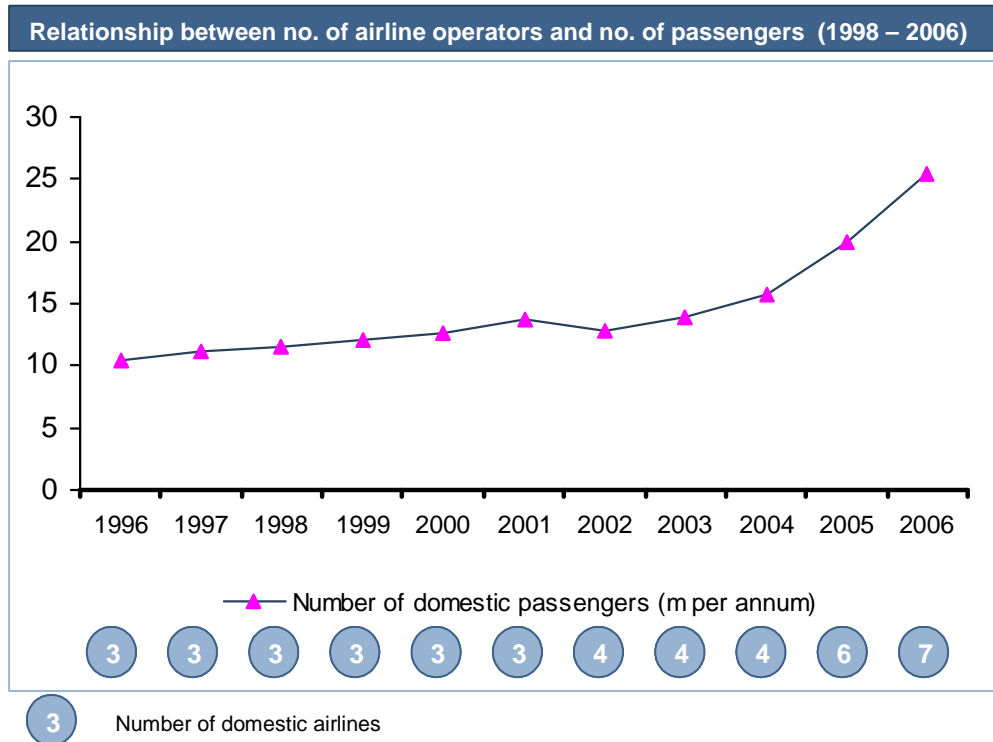


¹ JPM for LLU as a % of DSL lines for Australia, Dec 2005; Informa for DSL % of access lines, Q3 05; Analysys for LLU and a % of DSL lines, September 2005
Spectrum analysis

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The benefit of increasing competition can also be seen in other industries in India. One example that stands out is the airline industry that has taken off with increasing competition, though it can be argued that competition has been sustained by increasing number of passengers.

Exhibit 2: Effect of competition in the airline industry in India



Source: Airlines 2007: Opportunities & Challenges:- By Warwick Brady Chief Operating Officer Air Deccan, Spectrum / Value Partners analysis

Competition also has a critical role to play in stimulating both innovation and investment. Below we have described various views on why competition has such an impact on innovation.

Exhibit 3: Why competition drives innovation

Competition allows diversity in approach. Competition allows constant experimentation and innovation in what to produce, how to organise production, and how to price output. In effect, competition lets 'many flowers bloom' and allows diversity of thinking i.e. 'many minds are better than few'

Competition allows the entry and exit of firms in markets, which is critical for growth. The entry and exit of firms has been shown to account for a substantial share of productivity growth. As Barnes and Haskel note: "The major insight from plant-level evidence is that at least half of productivity growth over a decade is due to

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changes in the market fortunes of good and bad firms, with entry and exit particularly important in this reallocation process"¹. Lack of competition allows weaker firms to survive and improve gradually.

Competition ensures that only firms that innovate rapidly and successfully survive

Competition creates incentives for firms to innovate to reduce production costs. With effective competition prices are set by the market² and firms retain cost reductions creating strong incentives to innovate to cut costs. In an ineffectively competitive industry, or with a regulated monopoly, prices and costs for individual firms are more closely linked – thereby weakening incentives to innovate to cut costs.³

Competition allows benchmarking to improve performance. Owners and managers of competitive firms have other firms in the same market against which to benchmark performance. Improved reward systems can therefore be implemented based on differences in performance due to effort and innovation, rather than differences due external events impacting the industry as a whole.⁴

This theory has been borne out time and again in different markets. Below we highlight views of a number of economists on the role that competition has in driving innovation.

- In a comparison of regulation and performance in OECD countries, Alesina et al (2003) found that barriers to entry (and restrictions of competition) are negatively related to investment and innovation.⁵ The study focussed on airlines, road freight, railways, telecommunications, postal services, electricity and gas. They found that a reduction in barriers to entry and increasing competition leads to a reduction in the mark-up of prices over costs, and hence to a reduction in the penalty for expanding the capital stock and production.⁶
- A study by the OECD (2003) on ICT and economic growth concluded in relation to policy implications that: "... *policy should foster market conditions that reward the successful adoption of ICT; a competitive market environment is key for this to happen.*"
- The World Bank (1999) in examining competition in wireless telecommunications noted: "*Many governments, particularly in developing and emerging market economies, still doubt the benefits of competition in wireless services. But international experience shows that competition in any of the digital technologies brings substantial benefits to users and creates powerful incentives for incumbent fixed-line operators to lower prices, introduce new services, and increase productivity*"⁷
- Nickell (1996), in a general review of competition and corporate performance in the UK, concluded that "... *competition, as measured by increased numbers of competitors or by lower levels of rents, is associated with a significantly higher rate of total factor productivity growth*".⁸ Nickell also concluded that "... market power, as captured by market share, generates reduced levels of productivity".
- An OECD (2001) study of regulation, market structure and performance in telecommunications concluded that: "*Based on the comparative experience of a large set of OECD countries over the 1990s, it provides*

¹ Mathew Barnes and Jonathan Haskel. 2000. "Productivity, competition and downsizing." Paper for HM Treasury seminar held at 11 Downing Street on "Economic Growth and Government Policy".

² This concept is known as price takers where players in a market take the price set by the market and cannot influence the price themselves

³ Brian Williamson. 2000. "Competition, policy stability and growth". Paper for HM Treasury seminar held at 11 Downing Street on "Economic Growth and Government Policy".

⁴ Farrell. 2001. "Monopoly Slack and Competitive Rigor", in Eric Rasmusen, Readings in Games and Information. Oxford: Blackwell Publishing.

⁵ Alberto Alesina, Silvia Ardagna, Giuseppe Nicoletti, and Fabio Schiantarelli. March 2003. "Regulation and investment". National Bureau of Economic Research Working Paper 9560.

⁶ The barriers to entry indicator took a value of 0 when entry is free (i.e. a situation with three or more competitors and with complete ownership separation of natural monopoly and competitive segments of the industry) and a value of 6 when entry is severely restricted (i.e. situations with legal monopoly and full vertical integration in network industries). The UK telecommunications market falls between these two extremes.

⁷ World Bank Viewpoint "Competition in mobile telecommunications". 1999. <http://rru.worldbank.org/viewpoint/HTMLNotes/184/184rosso.pdf>

⁸ Stephen Nickell. 1996. "Competition and Corporate Performance". *Journal of Political Economy*, Vol 104(4).

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empirical support evidence that liberalisation of entry and the development of effective competition in telecommunications services generally leads to higher productivity, lower prices and better quality.”¹

These examples support the idea of the link between competition and investment/innovation.

In terms of the telecommunications market, there is also a clear correlation between competition and spectrum efficiency for any given market. Since the mid 1990's global telecommunications regulators have increasingly resorted to the use of market mechanisms to govern the allocation and destination of use of spectrum. The key changes that are being introduced are:

- **Spectrum liberalisation:** owners of spectrum rights are free to decide which technology to use and which services to provide with it
- **Spectrum trading:** hand-in-hand with liberalisation, the introduction of trading should allow spectrum rights to be allocated via market mechanisms to the users that value it the most.

The UK regulator, Ofcom, has been a strong advocate for the use of market mechanisms to improve spectrum efficiency.

Exhibit 4: Ofcom Spectrum Framework Review²

Ofcom believes that spectrum access should be deregulated where appropriate with market mechanisms being applied to the maximum extent possible where deregulation cannot be applied. The key rationale for allowing the market to make allocation and assignment decisions is that firms have the best knowledge of their own costs and preferences and a strong incentive to respond to market signals and to put resources to their best possible use. This approach is almost unanimously advocated by commentators, was strongly endorsed in responses to the Spectrum Framework Review Consultation and was one of the key recommendations of the Cave report

However, spectrum liberalisation and spectrum trading cannot work without a fully liberalised and competitive market. In a dynamic market such as telecommunications, regulators are seeking to create incentives and opportunities for users to make the most efficient use of radio spectrum.

The previous traditional model of regulators simply deciding which bands may be used, and by whom, is inflexible and inefficient in a competitive market. It does not allow operators to make decisions based upon their own individual circumstances and requirements and there is less scope to acquire additional spectrum for valuable applications or to adopt cheaper alternatives. There is also little incentive for spectrum holders to increase spectrum efficiency beyond the required minimum.

Therefore, a healthy competitive market combined with the use of market mechanisms for the allocation of spectrum will ensure that prospective spectrum holders will make the most economically productive use of radio spectrum.

However, competition for competition's sake is not an end in itself and in fact intense competition may have an adverse effect on innovation and investment. This is accurately captured in the TRAI Consultation paper and there are a number of potential consequences of intense competition in a growing market such as India's.

¹ Oliver Boylaud and Giuseppe Nicoletti. 2001. "Regulation, market structure and performance in telecommunications". OECD Economic Studies No 32.

² Ofcom Spectrum Framework Review

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This could include predatory pricing, thereby impacting the ability of operators to invest in innovation, networks, systems and processes as scale increases.

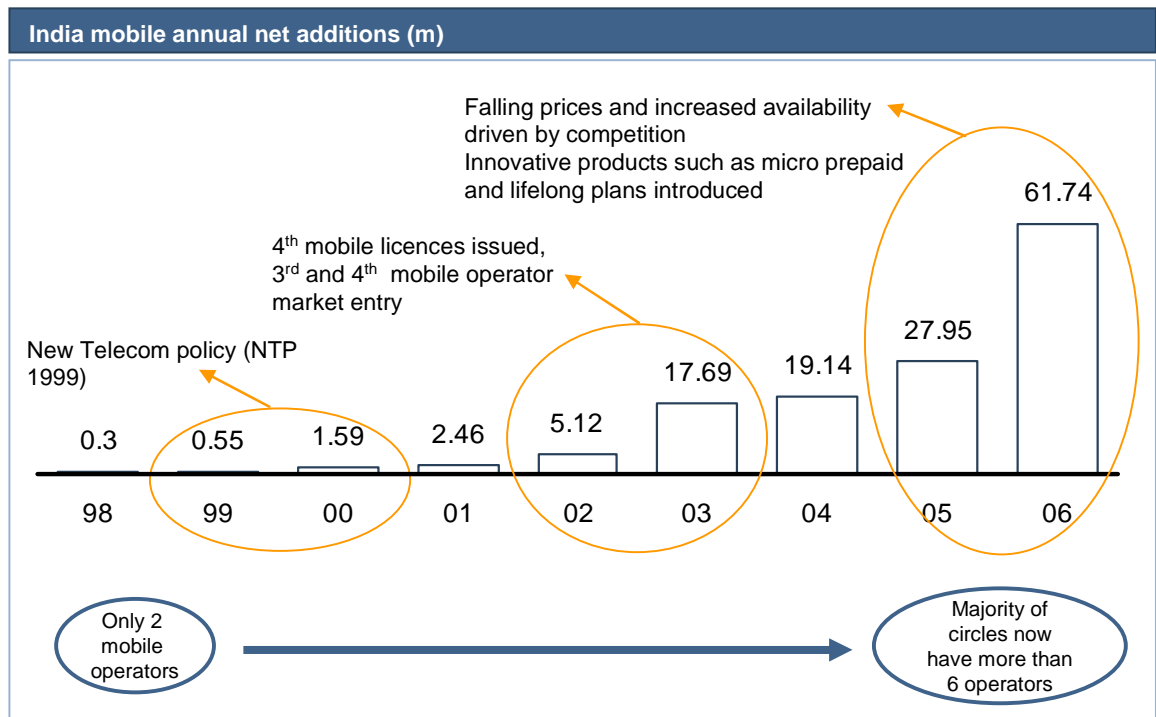
Whilst there is clear correlation between competition and the degree of investment/innovation, intense competition may have an adverse impact. However, market forces will ultimately determine the optimal level of competition and it should not be the regulator's role to try and determine the optimal number of players in the market. The relative risks and benefits of free market competition in the Indian context are discussed in more detail in section 1.4

1.1.2 The Indian mobile market is an excellent example of the consumer benefits which competition can bring

The benefits of competition and the success of a pro-competition regulatory regime are even clearer when we examine the growth of the mobile market in India – [this is a frequently quoted case study globally on the benefits of competition for consumers.](#)

Increasing competition has had a massive impact on pricing which has led to spectacular growth. This scale has subsequently ensured operator profitability. This has been driven, in part, by a stable policy and regulatory regime which should be commended. The result is a win-win-win for consumers, operators and Government receipts.

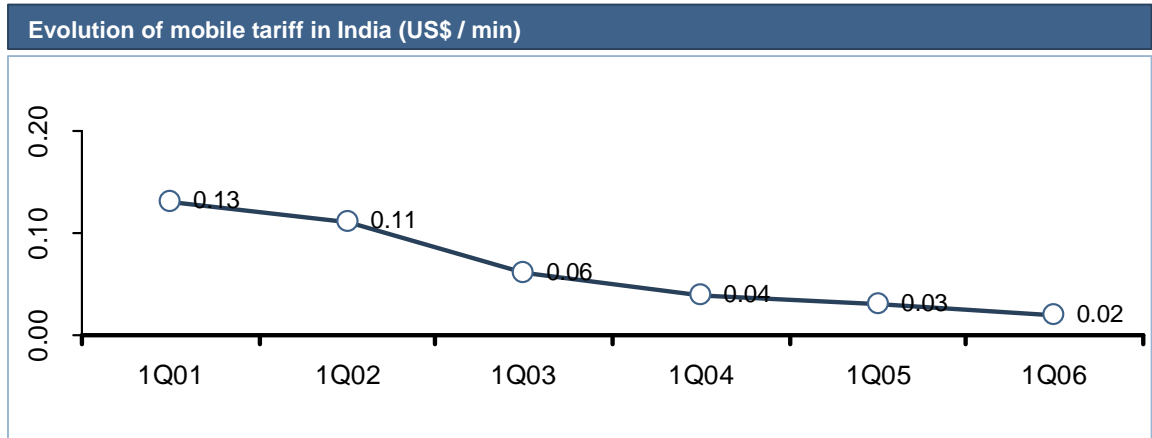
Exhibit 5: Mobile market in India: Impact of access level competition on market growth



Source: Morgan Stanley, Merrill Lynch, Informa

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Exhibit 6: Mobile market in India: Impact of access level competition on pricing



Source: Morgan Stanley, Merrill Lynch, Informa

The increased levels of competition in the Indian mobile market, following market liberalisation, has also resulted in increased levels of investment in network infrastructure by both existing players and new entrants. It has also resulted in the launch of new innovative products and pricing plans such as micro prepaid and lifelong plans.

The question of whether the current level of competition is sustainable and whether the Indian market can accommodate further competition amongst operators is discussed further in sections 1.3, 1.4 and 1.6.

1.1.3 Conclusion

In summary, the significant increase in competition in the Indian mobile market for the provision of services has resulted in substantial consumer benefits. The increase in the number of mobile subscribers has made India the fastest growing mobile market in the world, whilst the affordability of mobile services has decreased significantly over the period. The increased levels of competition has also resulted in increased levels of network investments by access providers and the launch of new innovative products and pricing plans.

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1.2 Regulatory intervention essential to prevent threat of abuse of market dominance

All countries have statutory provisions that prohibit anti-competitive conduct which, by definition, have the purpose or effect of preventing, distorting or limiting competition. Whilst market dominance or the possession of significant market power is not prohibited, in order to ensure healthy competition in the sector, regulators will impose legislation that prohibits the abuse of this dominance and may disallow M&A activity should they feel that this will threaten the overall success of the market.

A number of criteria with regards to competition policy and the control of dominant behaviour vary, dependent on the jurisdiction and the industry. The regulator will need to decide:

- The methodology for determining dominance including setting the threshold beyond which the operator is deemed as dominant and deciding on what determinant this value should be based, e.g. subscribers or revenues
- Those actions viewed to be 'abuse' of this dominance and thus prevented
- Methods for regulating and enforcing legislation designed to prevent the abuse of dominance.

As discussed in section 1.1, effective competition can lead to a wide range of benefits to consumers, operators and Governments. Conversely, an operator which is market dominant means it is capable of acting independently of market forces and is able, therefore, to constrain the development of competition. It is for this reason that most regulators impose a series of regulations to prevent abuse of market dominance.

1.2.1 Preventing abuse of dominance, particularly in telecommunications, is essential for market growth

Whilst preventing abuse of dominance is important in all industries, there are some actions that are specifically pertinent to telecommunications. In many markets, the entry of new operators into the telecommunications industry has been associated with allegations of anti-competitive behaviour on the part of operators with a dominant market position (i.e. incumbent). Such examples of anti-competitive behaviour include price predation, price squeezing, price discrimination and mandatory product and/or service bundling. In order for new entrants to compete on a "level playing-field" it is necessary for regulators to ensure that the possible anti-competitive conduct by the incumbent is prohibited and policed.

Similarly, it is the regulator's responsibility to ensure that operators achieve a size, either organically or through acquisitions, which allows them to behave in a competitive manner. A strong regulatory framework, therefore, is fundamental to the successful development of a dynamic competitive industry in any market. Some of the specific issues relating to dominance in telecommunications are detailed in the exhibit below.

Exhibit 7: Example actions to be monitored by telecommunications regulators

Access pricing

The issue of network interconnection is extremely important for new entrants either in the mobile sector or the local fixed voice sector primarily because a significant portion of traffic generated by the new entrants is delivered "off network" and, therefore, requires interconnection with another operator (often the incumbent) in order to be terminated. Given the dominance of the incumbent, if it should create a hostile environment to new entrants wishing to secure interconnection to its network, then the potential to reduce or constrain the

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development of competition is very high. In particular, the level of interconnection charges can determine both the prices at which new entrants can offer services and products to end-users, and consequently, the financial viability of new entrants. Therefore, most regulators determine, if necessary, the maximum interconnection charge that an incumbent can levy on new entrants.

Tariff rebalancing

In many cases the incumbent will seek to maintain market share, by cross-subsidising low-price local calls, which undercut realistic price targets for new entrants, with expensive international and long-distance calls. In many case regulators have introduced legislation that requires incumbents to levy their local voice calls, at least above their wholesale rates. There is a potential risk however; that this can significantly increase the cost of calls for local subscribers, thus limiting the ability of the incumbent to meet their public service obligations and the relative advantages and disadvantages of tariff rebalancing should be assessed on a case by case basis.

The impact of dominant market share on the mobile telecommunications market can be seen in a number of countries – both developed (e.g. Italy, Spain, Australia) and developing (Indonesia, Malaysia). Regulators in a number of other jurisdictions have been more effective in preventing the abuse of dominance (UK, Hong Kong, USA). At its current stage of development it is fair to argue that India also falls into this category with a highly competitive market, not dominated by an single operator on a national basis.

Allowing a single operator to maintain dominant control in a market will restrict the overall development of that market. In particular:

- Whilst EBITDA margin may appear to be high throughout the market, this is mainly due to the incumbent's superior profitability – other operators are less likely to experience such positive results
- Markets dominated by a single player do not experience the same degree of price decline financial results and therefore opportunity for the consumer. In a developing market such as India, should price decline be restricted due to the unregulated presence of a dominant player, then this is likely to negatively infringe on mobile penetration rates

Markets which impose regulations specifically on the operations of dominant players, or those markets which restrict dominance in the first place (by preventing M&A activity that leads to the creating of a dominant entity) are often more profitable. All market players are likely to experience similar EBITDA margins. This will result in a more significant price decline due to healthy competition, driving mobile take-up and consumer flexibility. These arguments are exemplified in the exhibit below.

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Exhibit 8: Impact of dominance on market development

Markets dominated by single operator

Country	Dominant player	Market leader market share (%)	Market leader EBITDA margin (%)	Market EBITDA margin (%)	Three year price decline (%)
Italy	TIM	41.1%	45.5%	40.3%	-15.8%
Spain	Telefonica	45.6%	46.7%	40.4%	-18.2%
Australia	Telstra	43.5%	39.7%	31.2%	-22.2%
Malaysia	Maxis	41.4%	55.6%	50.1%	-25.6%
Indonesia	Telkomsel	53.8%	71.6%	67.2% ⁽¹⁾	n/a

Competitive markets

Country	Dominant player	Market leader market share (%)	Market leader EBITDA margin (%)	Market EBITDA margin (%)	Three year price decline (%)
UK	n/a	24.1%	33.1%	32.2%	-15.4%
Hong Kong	n/a	32.4%	28.8%	29.1% ⁽²⁾	-29.1% ⁽³⁾
USA	n/a	26%	30.3%	33.1%	-20.0%
India	n/a	21.8%	36.9%	36.6%	-35.3%

Note: (1) Overall EBITDA % in Indonesia is influenced significantly by Telkomsel which generates 75% of market revenues (2) Excludes EBITDA margin of Sunday which is experiencing independent financial problems (3) Price decline for 3 years extrapolated based on YoY decline 2005 -2006

Source: Merrill Lynch, Spectrum / Value Partners analysis

Further to market profitability and price decline, dominant behaviour which restricts competition in the sector, will have a number of other negative implications for the market. These include:

- Lack of innovation
- Poor quality of service
- Limited diversification in customer proposition

These issues are discussed in more detail in the forthcoming sections (1.3 and 1.4) where Spectrum Value Partners argues that, once all abuses of dominance are prohibited by the regulator the market should then be left to operate freely.

1.2.2 Internationally, strict regulations are imposed to prevent abuse of dominance

All developed markets have instigated policy frameworks to prevent the abuse of dominance. This is a policy decision articulated either through the relevant Acts (e.g. a Telecommunications Act), Codes of Conduct or licences, usually relating in particular to competition in the sector. The responsibility of controlling the actions of dominant players in the market may lie with the industry regulator, or alternatively with a separate competition regulator.

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When determining which operators should be classified as dominant, the regulator must make two key decisions. Firstly, they must determine which indicator to use when measuring the power of the operator, that is, should it be based on market share of subscribers, market share of revenues, infrastructure control etc. Secondly, the regulator will then need to decide, at what level an operator should be deemed as dominant, e.g. when they have 50% market share of all subscribers.

a) Determining market dominance

Internationally there is no set precedent for the most suitable method for determining dominance. In most cases, the regulator will assess potential instances of dominance on a case by case basis. Some of the various approaches for defining dominance are illustrated in the exhibit below.

Exhibit 9: International case studies summarising methodology used to determine dominance

Indicator	Methodology applied	Examples
Market share	<ul style="list-style-type: none"> Based on either market share of all subscribers or share of total market revenues Most popular method applied internationally 	<ul style="list-style-type: none"> Singapore UK New Zealand
CR4 ratio test	<ul style="list-style-type: none"> Used to monitor and regulate significant collateral market power E.g if the post-merger combined market share in the relevant market is less than 75% then the merger is allowed This is often subject to additional conditions such as the market share of the merged entity 	<ul style="list-style-type: none"> Hong Kong Australia Canada
Overall market HHI	<ul style="list-style-type: none"> E.g. in markets which are considered to be moderately concentrated, based on HHI rating, then any transactions that will raise the HHI rating by 100 - 250 points (depending on regulator) are considered to be a potential market threat 	<ul style="list-style-type: none"> United States European Union Hong Kong

Source: Regulator websites, TRAI, Spectrum / Value Partners analysis etc.

As illustrated above, the most used indicator of dominance is market share. This is normally based on share of subscribers however could also be based on adjusted gross revenues or both.

It should be noted that in order to determine market share, the regulator should first define the relevant market access segment. This is likely to be dependent on the nature of the potential merger, and may include the mobile, fixed and or wholesale markets.

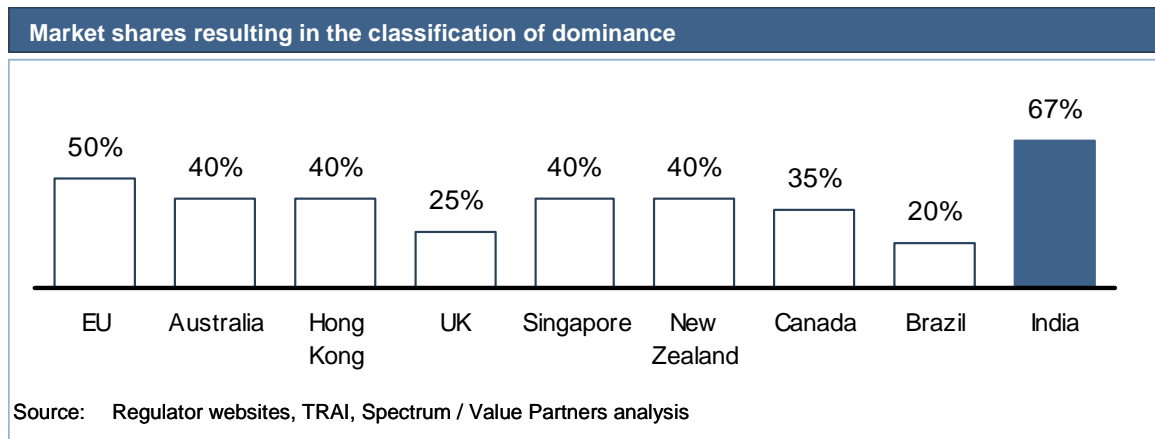
b) Level of market share that demonstrates market dominance

A number of jurisdictions, which base their measure of dominance on market share, will declare an operator dominant, once their share of subscribers exceeds about 40% of the mobile subscriber base.

However, in the vast majority of markets, breaching the threshold of dominance does not automatically stop a merger from occurring; breaching the threshold ensures that the transaction receives far greater regulatory and competition review to prevent possible abuse of market dominance.

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Exhibit 10: Market shares resulting in classification of 'dominance'¹



Relative to other markets, the proposed level of 67% as a prescription of dominance in India is particularly high. It will do little to limit dominant behaviour in the market, should operators merge to create an entity with, for example, a 60% share.

The access segment, from which the market share is derived, should be based solely on mobile subscribers rather than both mobile and fixed because

- If the total reasonable market is increased (by including fixed) then it is even less likely that a player will be classed as 'dominant', this giving the regulator less control
- Fixed and mobile subscribers have different user profiles and cannot be directly compared/bundled
- Aggressive growth in the mobile sector separates it from the fixed which is relatively static

1.2.3 The threshold for 'dominance' should be reduced to between 35-40%

Spectrum Value Partners recommends that the indicator of dominance is based on mobile subscriber market share (as is most commonly adopted internationally). The level of dominance should be set at between 35-40%. Should an operator or a prospective merged entity exceed this threshold then either the merger should be restricted or additional regulations should be placed on the operations of the dominant player (as opposed to automatically putting an ex-ante block to the planned consolidation). These recommendations are based on international best practice and also the Indian specific market context, as detailed below.

Many regulators also recognise that market share is not the only indicator of the state of competition within a market. Other indicators include buyer power, economies of scale, ease of market entry, vertical integration and excess pricing and profitability.

In the Indian market, the level beyond which an operator is seen as dominant is currently set at such a high threshold, it will do little to prevent merger and acquisition activity. Consolidation is an essential requirement

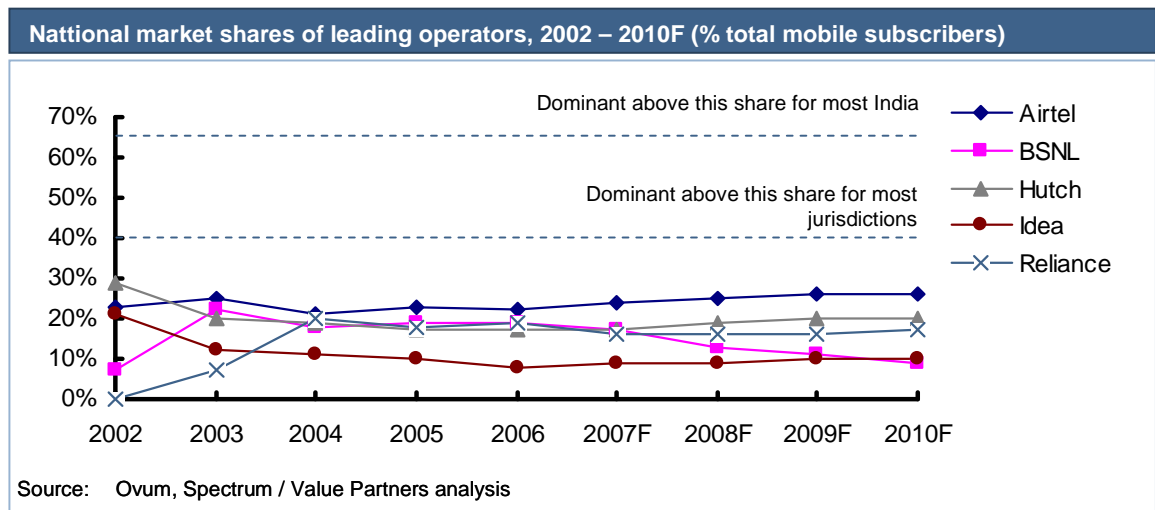
¹ These figures relate to dominance. In many instances the regulator will also set a level that indicates 'significant market power', which is invariably lower than 'dominance'. At this stage, companies operations will be monitored to ensure that they do not act anti-competitively.

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for the continued development of the Indian telecommunications market, and should not be entirely prevented. However, with current 'dominance levels' set at 67% there appears to be a real risk of market dominance if market leaders merge.

Currently the market demonstrates a good basis for competition, with no operator approaching a level that could be defined as 'dominant'.

Exhibit 11: National market share of leading operators in comparison to 'dominant' level



A merger between market leaders would in many cases take the operator above internationally accepted thresholds of 'dominance'. However, the merged entities, despite their significant market power in particular licence areas (based on either share of total subscribers or share of adjusted gross revenues) will not be subject to the stringent legislation required to restrict an operator of this size. As such, they may act in a way so as to significantly negatively impact on the development of the market and the operation of competitors.

The hypothetical analysis presented below highlights the M&A activity that would be restricted or tightly regulated in those developed markets where dominance is set at 40% market share. However, should the proposed 67% share be implemented in India, then all these hypothetical cases would be allowed regardless. This has the potential to significantly impede on the overall market development by restricting healthy competition in a number of licence areas. Setting the dominance threshold too high does not provide the regulator with sufficient opportunity to intervene.

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Exhibit 12: Hypothetical market shares and restricted / unrestricted M&A activity

Market share – Total Subscribers


State	"Total Reliance+ Airtel"	"Total Airtel+ Hutch"	"Total Airtel+ Idea"	"Total Reliance+ Idea"	"Total Reliance+ Hutch"	"Total Idea+ Hutch"
Calcutta	47.8%	49.3%	22.5%	25.2%	52.0%	26.8%
Mumbai	39.3%	46.4%	19.8%	19.5%	46.1%	26.6%
Delhi	41.8%	48.8%	39.9%	27.3%	36.1%	34.3%
Andhra Pradesh	49.3%	41.6%	44.4%	34.9%	32.1%	27.2%
Madhya Pradesh	53.7%	21.6%	45.8%	56.3%	32.1%	24.2%
Nationwide	42.2%	41.4%	33.2%	27.1%	35.3%	26.4%

Market share – AGR market share

State	"Total Reliance+ Airtel"	"Total Airtel+ Hutch"	"Total Airtel+ Idea"	"Total Reliance+ Idea"	"Total Reliance+ Hutch"	"Total Idea+ Hutch"
Calcutta	45.7%	55.6%	25.6%	20.1%	50.1%	30.0%
Mumbai	37.8%	49.1%	19.5%	18.3%	47.9%	29.6%
Delhi	54.3%	58.6%	48.7%	25.0%	34.9%	29.3%
Andhra Pradesh	46.3%	41.3%	42.6%	30.4%	29.0%	25.3%
Madhya Pradesh	51.1%	27.2%	50.8%	47.5%	23.9%	23.6%
Nationwide	41.5%	42.5%	33.9%	23.2%	31.8%	24.2%

Note: (1) Subscriber numbers as of May 2007, revenues as of Quarter ending March 2007

Source: AUSPI, COAI, Spectrum / Value Partners analysis

 M&A would be restricted in other jurisdictions (market share > 40%), but not India

1.2.4 The current requirement for at least three access providers per licence area should be upheld

As stated in part 2.56 of the TRAI Consultation document, according to licence conditions 'Intra-service area mergers and acquisitions may be allowed if there are no less than three operators providing access services in a service area'. This condition was put in place to ensure there is always sufficient competition in a licence area.

Spectrum Value Partners recommends that the current requirement for at least three access providers in each service area be upheld for two main reasons:

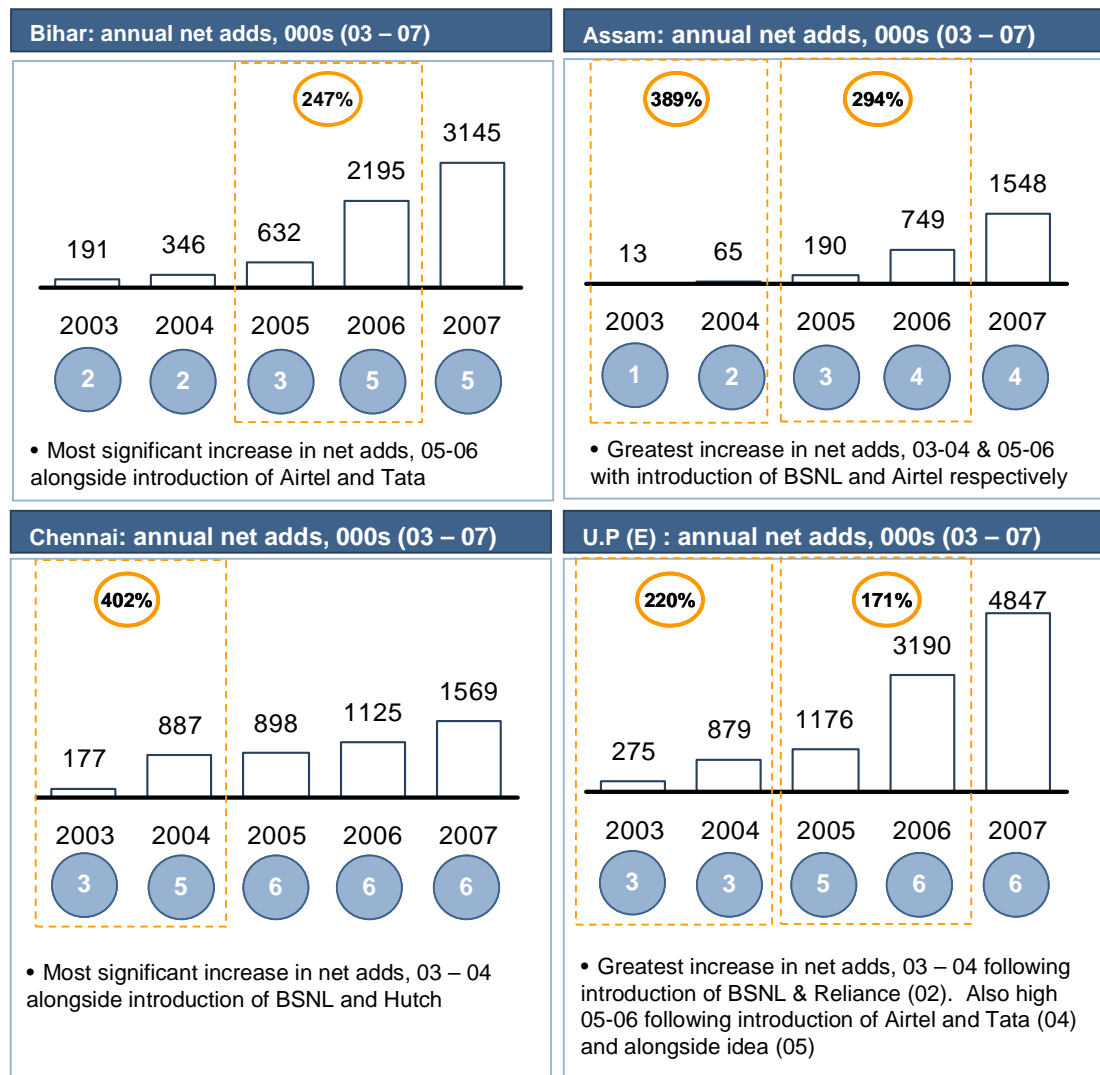
- As detailed in the exhibit below, the most significant year on year growth in the total number of net ads (shown here in a selection of regions) is most significant directly following the introduction of a new

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entrant. This is the case, particularly once there are at least three access providers operating within a circle

- Encouraging new entrants to launch at a time of rapid market growth, will not only promote healthy competition in the short-term but will also provide a suitable basis for market consolidation in the long-term

Exhibit 13: Relevance of three access providers as a measure of minimum competition in a circle



Note: Regions have been chosen at random
 Source: AUSPI, COAI, Spectrum / Value Partners analysis

6 Number of access providers
 171% YoY growth rate of net adds

1.2.5 Conclusion

In summary, Spectrum Value Partners recommends that TRAI actively intervenes to prevent abuse of dominance in the sector. This may require restricting selected M&A activity, but at the very least will require strict operational regulation of any access provider defined as 'dominant'.

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We recommend that the definition of dominance be based on market share of mobile subscribers. The level of dominance should be set at between 35-40% and should an operator or a merged entity exceed this, then the access provider should be treated as dominant. Beyond this Spectrum Value Partners believes that regulation should not impede any consolidation that does not result in dominance.

Spectrum Value Partners believes that the current check of at least three access providers in a circle is a good measure of competition and should not be changed, as ensuring a high level of competition in each region is likely to be a successful contributor to mobile take-up.

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1.3 Market forces and not regulatory intervention are the best judge of competition

Telecommunications markets worldwide are highly dynamic and influenced significantly by rapidly changing technologies, consumer uptake and demand. As regulators struggle to keep a pace with such rapid change, in many cases the evolution of competition in the market has been left open to market forces. Spectrum Value Partners recommends that, due to the dynamic nature of the telecommunications market, particularly in India, TRAI limits their regulation of the sector to;

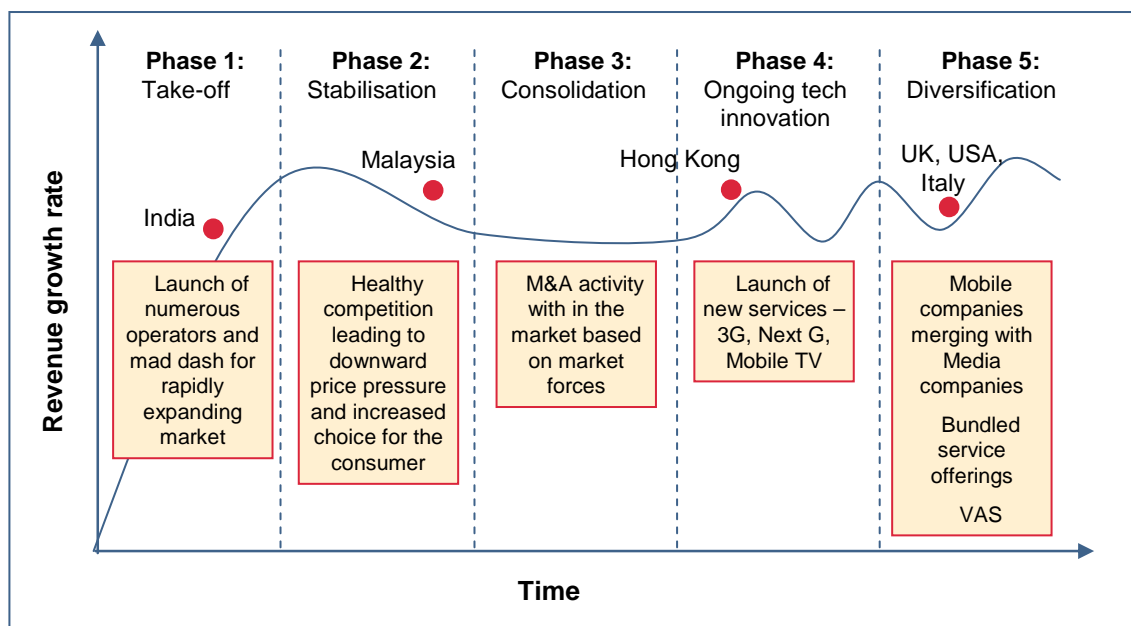
- Preventing abuses of dominance ,
- Allocating spectrum licences so as to ensure efficient use of spectrum and;
- Ensuring a minimum of three access providers per licence areas

In all other aspects, e.g. the maximum number of operators, pricing, choice of technology etc should be left to market forces to decide.

1.3.1 *The role of market forces is particularly important in a dynamic industry such as telecommunications*

The sustainable level of competition in an industry is forever changing. Regulatory intervention cannot keep pace with this rate of change - particularly spurred on by technology changes and rapid uptake in number of subscribers. The Indian market is in the early stages of a long running lifecycle which will continue to experience dramatic change over the forthcoming years.

Exhibit 14: Mobile telecommunications lifecycle

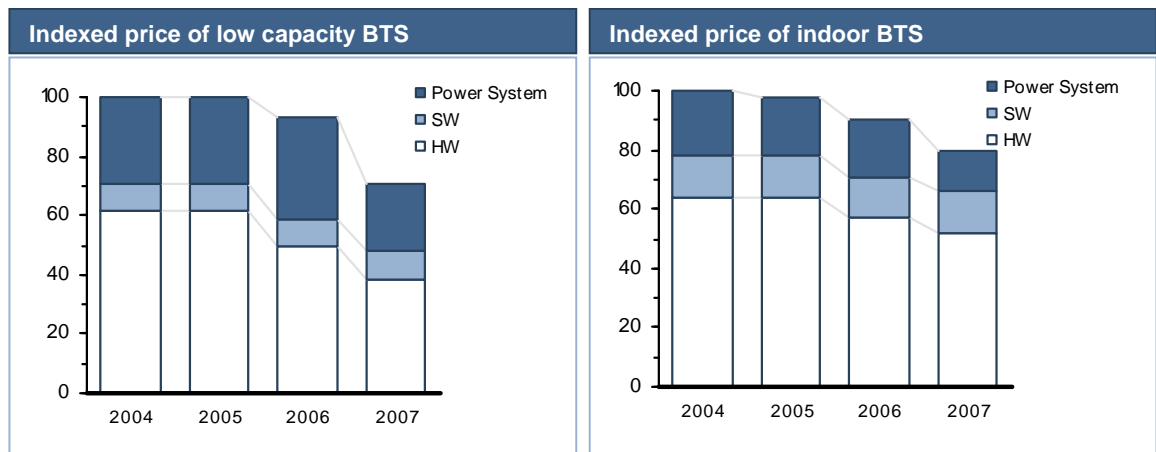


The market is likely to be subject to a number of forces, in particular:

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- In the current take-off phase and leading into stabilisation, barriers to entry will continually change and are therefore best determined by the market
- Increasing competition may impact industry profitability and may result in within-sector consolidation as the market enters stage 3
- The telecommunications and hardware industry is one of the most dynamic in the world, with ever changing costs and business models. As a consequence operators should be allowed to evolve independently in order to react most efficiently to market changes
 - for example, over the past four years, the cost of deploying a low capacity base station has decreased by CAGR 11%, despite the fact that the base stations are becoming more robust and utilise superior technology, as illustrated in the exhibit below

Exhibit 15: Cost of base stations, international average, 2004 - 2007



Source: Telecom LIVE, Credit Suisse estimates, Spectrum / Value Partners analysis

- Rapid technology changes are likely to have significant and rapid impact on the development of the sector, both at take-off and in phase 4, ongoing technical innovation
- Although some way off for India, as convergent trends gathers momentum, operators may wish to diversify their product offerings, either throughout the telecommunications space or into the media space. In order to ensure that the Indian market is capable of benefiting from international trends, operators should be allocated full flexibility to do this.


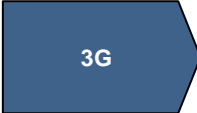
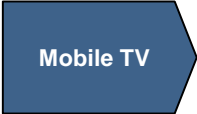
1.3.2 Regulatory policy should not restrict market competition or the development of new technologies

The regulator does have a role in the allocation of spectrum licences, which are a finite resource. They may wish to apply particular conditions to these licences, or to allocate them in a way as to promote market competition. For example, many countries used the auction of 3G licences as an opportunity to encourage new entrants to launch services. International regulators typically place no long term limit on the number of licences in a market. For example, they ensured that either there were sufficient 3G licences available to supply more than just the incumbent operators, or they specifically reserved licences for new entrants. Finally, international regulators are increasingly looking at spectrum trading. This has further reduced the regulatory intervention impact from historical licensing and strengthened the impact of market forces on deciding level of competition.

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TRAI's role in the development of new technologies within the industry is already being experienced in a number of areas, as summarised in the exhibit below.

Exhibit 16: New technology developments

	<ul style="list-style-type: none">• Regulator has made recommendations recently on the allocation and pricing of spectrum for BWA services<ul style="list-style-type: none">- however, spectrum is not currently available in the 2.5GHz band in India as it is already used by Department of Space (DoS) for its Insat satellites- non-standard 3.3GHz has been allocated on a first come first serve basis but very small spectrum allocation in this band and it is being used for 802.16d in India (fixed WiMAX)
	<ul style="list-style-type: none">• In 2H 2006, Govt. provided low-power spectrum in 2.1GHz band to 7 GSM players (BSNL, MTNL, Bharti, Maxis, Idea, Reliance and Hutch) to carry out 3G trials• In April 2007, Govt. allocated spectrum in the 1900Mhz band to Reliance to conduct trials using CDMA technology in Hyderabad• Regulatory issues around the 1900MHz band which both GSM and CDMA operators are claiming• No official policy on 3G spectrum allocation yet but auction is expected to happen in 2008
	<ul style="list-style-type: none">• Hutch offers small mobile video service (Hutch TV) over its EDGE network• Doordarshan is running mobile TV trials using DVB-H technology• On the whole, little activity in Mobile TV• Likely that spectrum suitable for DVB-H will become available in the medium term when the regulator reviews analogue TV allocations• Broadcasters have asked TRAI to include Mobile TV services within the terrestrial broadcasting policy

Source: Press releases, Spectrum / Value Partners analysis

Further details on the role of the regulator and the allocation of spectrum in promoting new technologies are contained in section 1.5.

1.3.3 Conclusion

Spectrum Value Partners recommends that due to the dynamic nature of the market, TRAI should not intervene to regulate competition in the market as market forces will promote the most efficient competition and will filter out any non-sustainable levels of competition. As the market is expected to continue to experience rapid change over the forthcoming years, imposing strict regulation on the sector would impinge on the rate of development, as no regulator is able to successfully pre-empt market evolution. This is particularly the case with telecommunications, where technology developments are continuing at pace.

The regulator should only seek to intervene, as previously discussed, if competition reduces and to prevent abuse of dominance. They can also impose a degree of control through spectrum allocation and licence conditions.

Submission on licencing terms and capping number of access providers

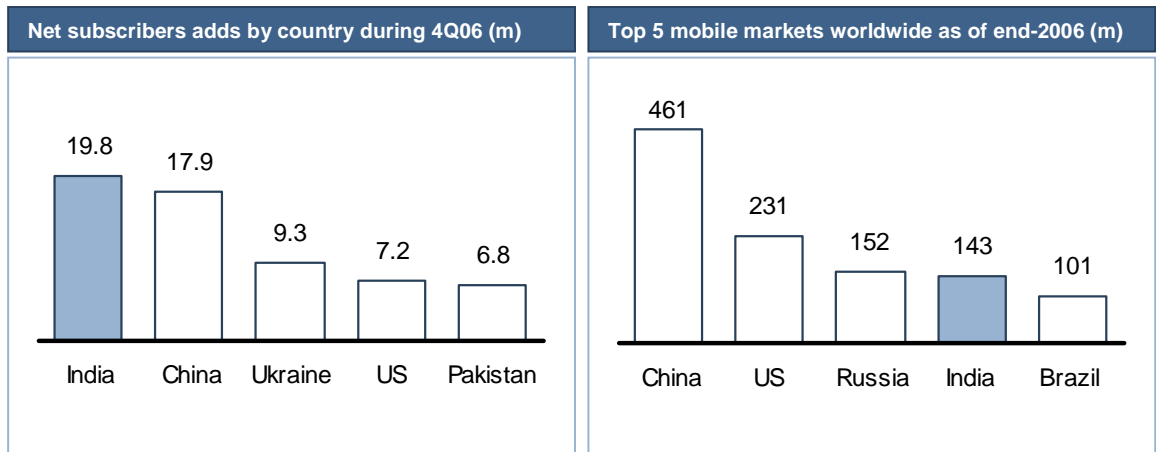
1.4 The Indian mobile market is likely to be able to sustain additional competition

The Indian mobile market displays a strong level of competition relative to other markets, with a substantial number of operators launching new regional services in the last few years. Despite this, Spectrum Value Partners expects that the market may well be able to sustain increased competition due to the historic performances of operators and the rapid forecasted growth of the total market.

1.4.1 The Indian market demonstrates healthy competition

Relative to other markets, the Indian market is growing rapidly. In the Q4 2006 it had the highest number of net subscriber additions of any country worldwide and now is the fourth largest mobile market in the world.

Exhibit 17: India mobile market growth and size relative to international comparators



Source: Informa, Mobile World, Spectrum / Value Partners analysis etc.

India is also one of the most competitive mobile markets globally – both in terms of the number of operators (with 4-7 operators in each circle) as well as extent of market concentration.

Submission on licencing terms and capping number of access providers

Exhibit 18: Number of access providers by country

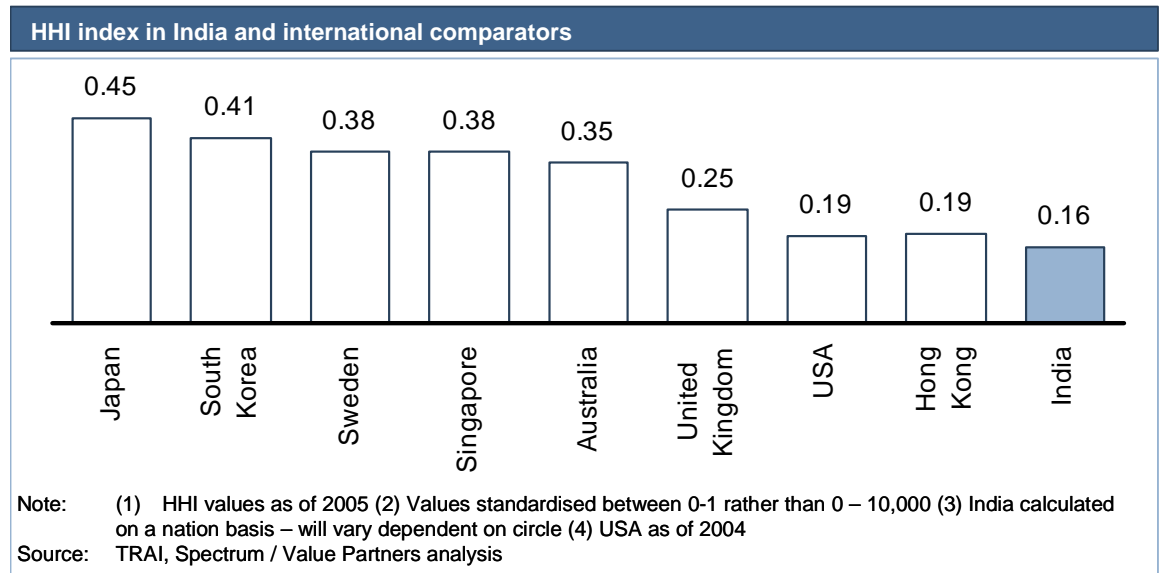
Market	2000	2002	2004	2006
Australia	6	4	4	4
Hong Kong	6	6	6	5
India	~4	~5	~5	~6
Japan	4	3	3	3
Singapore	3	3	3	3
Sweden	3	3	4	4
South Korea	4	3	3	3
UK	4	4	5	5

However may be up to 8 licensees in a circle

Note: Total number of Indian operators is a rounded average, as number of operators varies by circle
Source: Merrill Lynch, Spectrum / Value Partners analysis

A comparison of the HHI¹ scores, based on the total number and size distribution of firms, in India (as at September 2005) and the other international markets, shows that the current HHI in India is significantly lower than the HHI scores in all other international markets. This indicates the strong degree of competition in the market which is relatively un-concentrated.

Exhibit 19: HHI comparison of India vs. other international markets

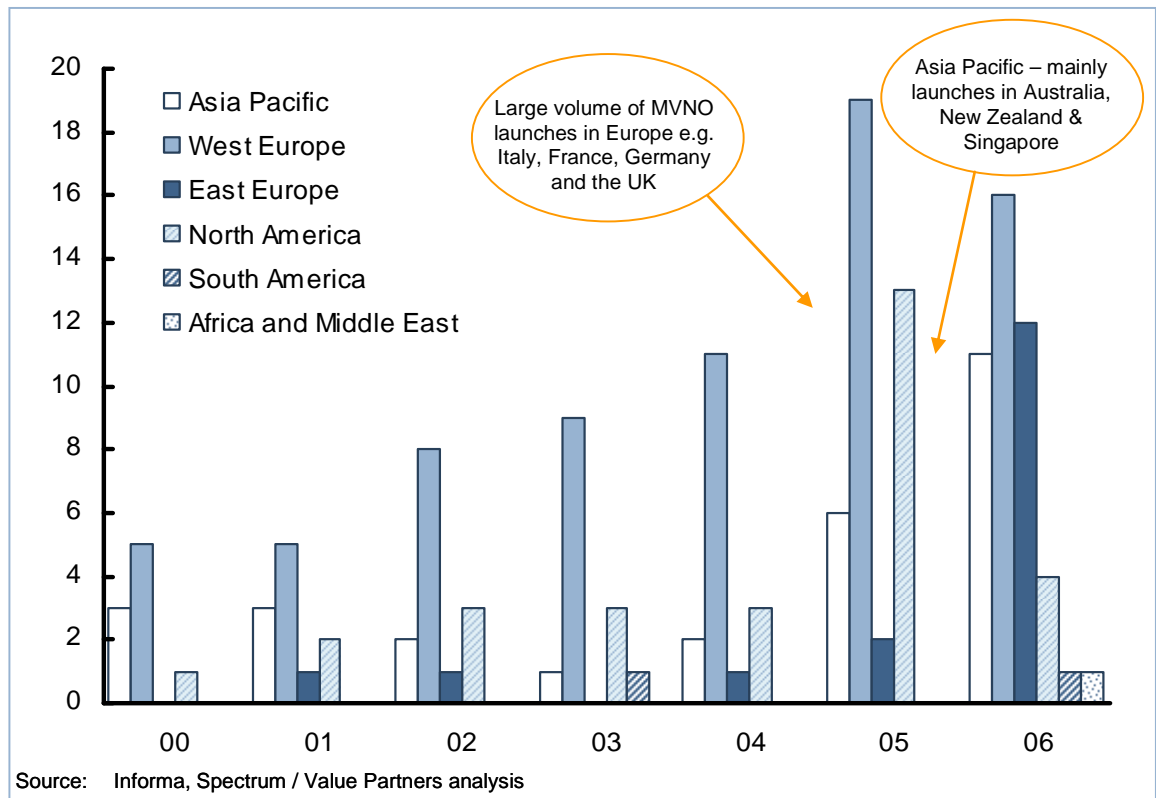


¹ The Herfindahl-Hirschman Index (HHI) is used to measure the level of market fragmentation. It should be noted for the purposes of this chapter that the outcomes resulting from the use of the HHI will vary between 10,000 and 0, where 10,000 implies that the market is a pure monopoly with one operator recording 100% market share and 0 implies a totally atomised market with all market participants recording a market share of 0%.

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It should, however, be noted that a number of more developed markets, whilst less competitive in terms of the number of access providers, are experiencing increased competition due to the introduction of MVNOs. The exhibit below illustrates how the number of MVNOs launching around the world has increased dramatically in the last few years. This has contributed to increased competition in a number of developed markets, to comparable or greater than the Indian market.

Exhibit 20: Number of MVNO launches by region, 2000 - 2006



The USA, for example has a particularly competitive MVNO market, with more than 30 MVNOs operating currently¹. The market is the most advanced in terms of customer segmentation, specialist niche and VAS targeted services. A number of the MVNOs operate on a localised rather than a national basis. However some, for example TracFone, has successfully offered pre-paid nationwide coverage, enabled by various host operator agreements. They have been successful in growing market share by specifically targeting Hispanic and 'unbanked' users, who are generally considered a niche market segment. Overall, the introduction of MVNOs in America has significantly increased the level of competition in the country (in many regions it is now more competitive than India) and has also helped to drive up mobile penetration which, relative to GDP, has historically been slow to take-off.

¹ Informa, MVNO strategies and forecasts to 2011

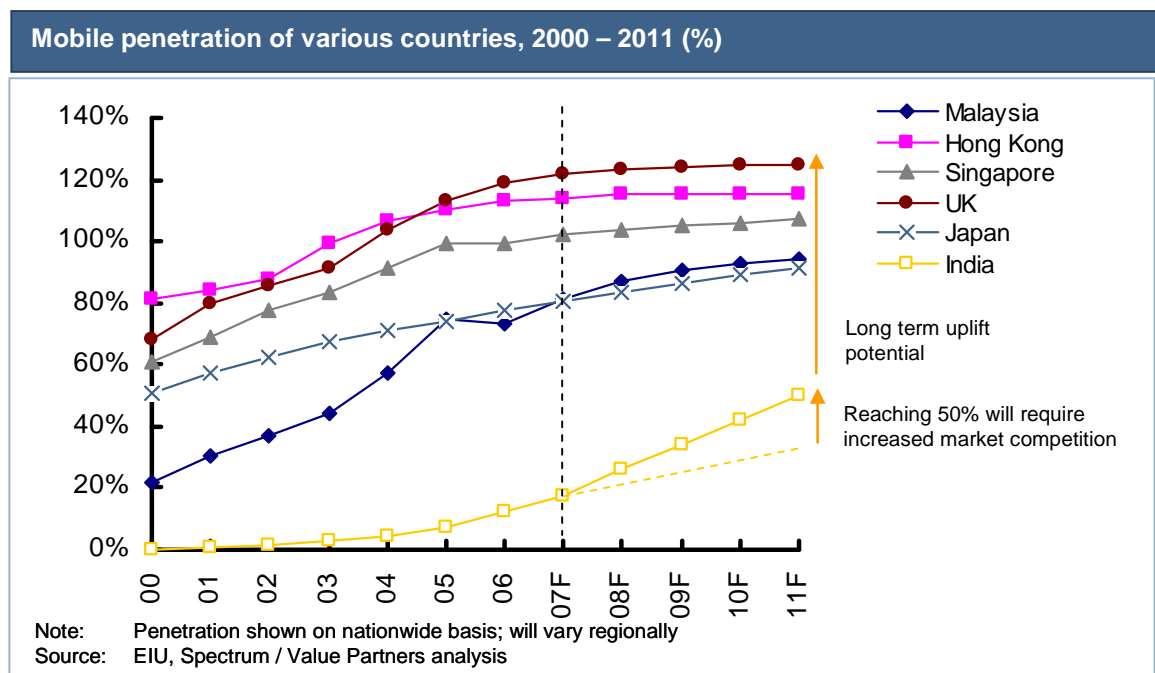
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1.4.2 **The market will continue to grow strongly for many more years and this growth should be able to support additional competition**

Despite the fact that the market is already highly competitive amongst access providers, Spectrum Value Partners believes that the market is large enough to sustain an increasing level of competition, particularly as it is expected to experience significant growth both in the short and long-term, and that it may benefit from a further increase in competition prior to natural consolidation.

The Indian population is of such a size that, as previously mentioned, the mobile market in India is already one of the world's largest. However, starting from such a low penetration base (as it still is currently) the market is expected to experience significant growth in the short term, taking penetration levels to approximately 50% by 2011. Furthermore, as development continues there is long term uplift potential – more developed markets, such as Hong Kong and Singapore are already experiencing penetration of more that 100%. Spectrum Value Partners believes that this growth will help to support additional competition in the sector.

Exhibit 21: Expected growth mobile penetration

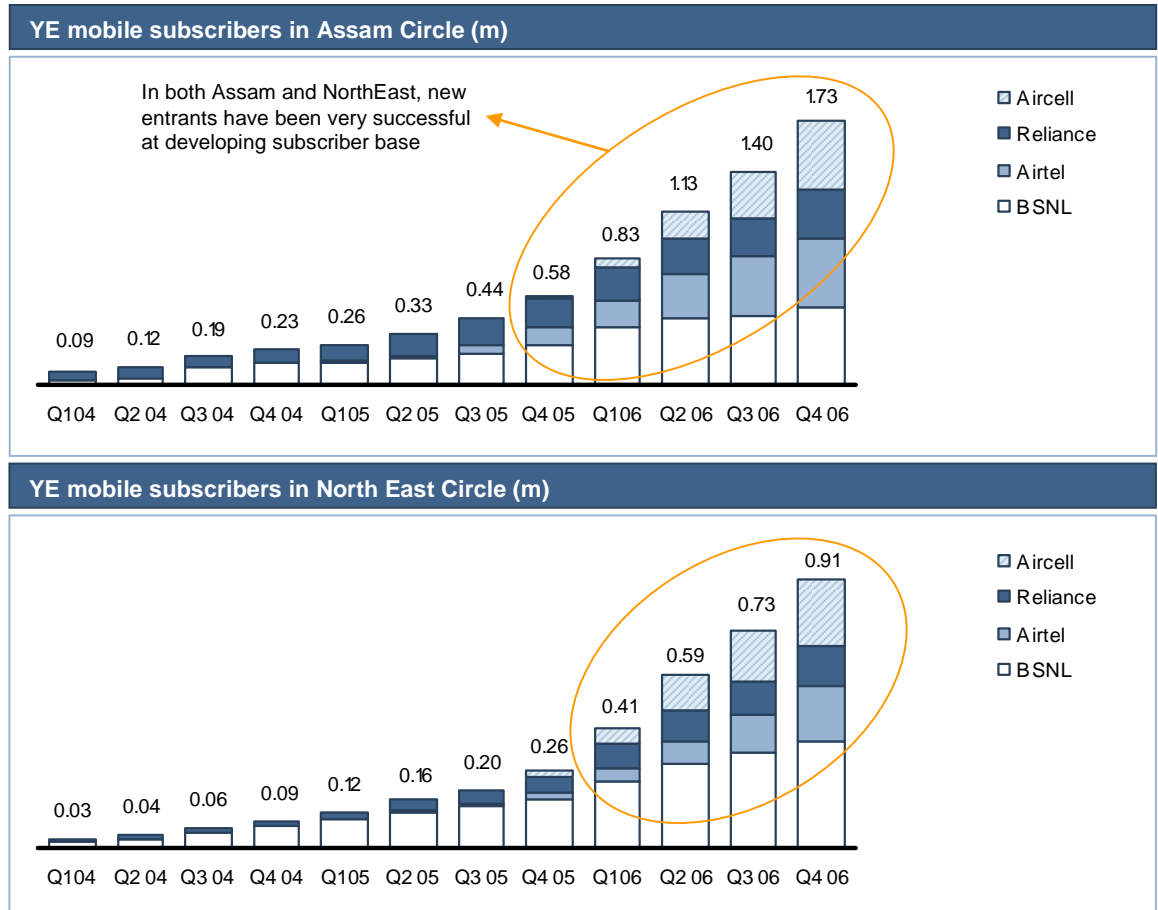


1.4.3 **Historical and current examples demonstrate the ability of the market to absorb additional competition**

The ability of the Indian market to sustain increased competition can be demonstrated by the net subscriber additions that have been gained by new entrants since their recent launch, despite the existence of established operators in those circles. As has been previously mentioned, in most cases the addition of a third or fourth operator will be the most significant driver of net ads.

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Exhibit 22: New entrants and market growth



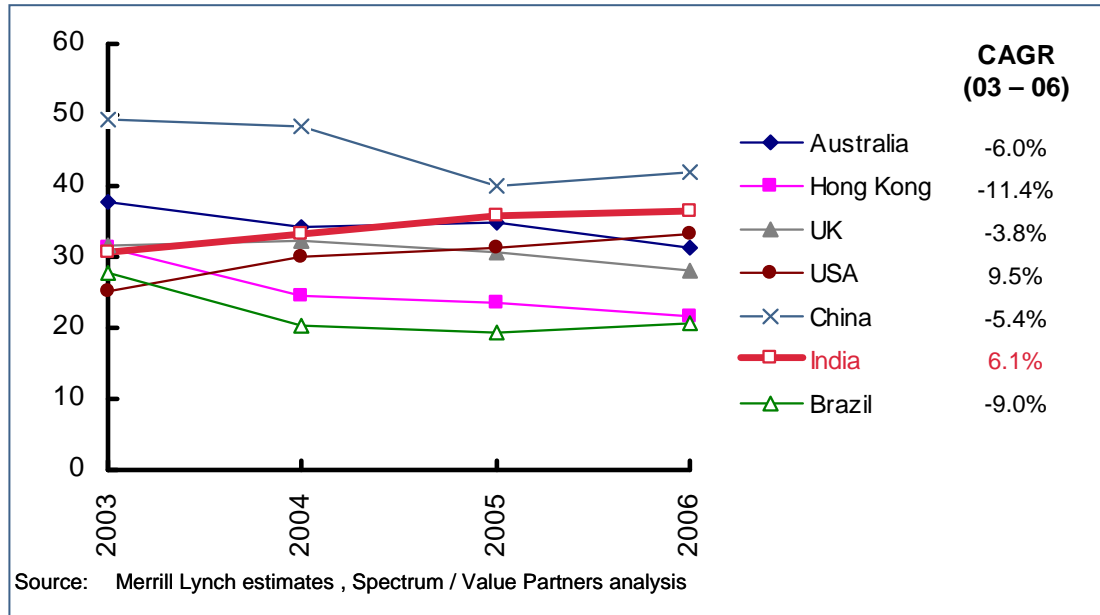
Source: Morgan Stanley, Informa

Overall the market has experienced encouraging growth in EBITDA margins over the past few years, growing at CAGR 6% (2003 – 2006). This growth rate is higher than a number of other countries.

The interesting point is that EBITDA of the industry has grown despite very high network expansion, including expansion in less attractive rural and semi-urban areas. Growth in EBITDA suggests that most operators (especially the larger operators) would have the financial muscle to fund a direct consequence of limited spectrum availability – the need to invest in more base stations (through cell splitting) to meet capacity requirements driven by a scorching pace of subscriber additions.

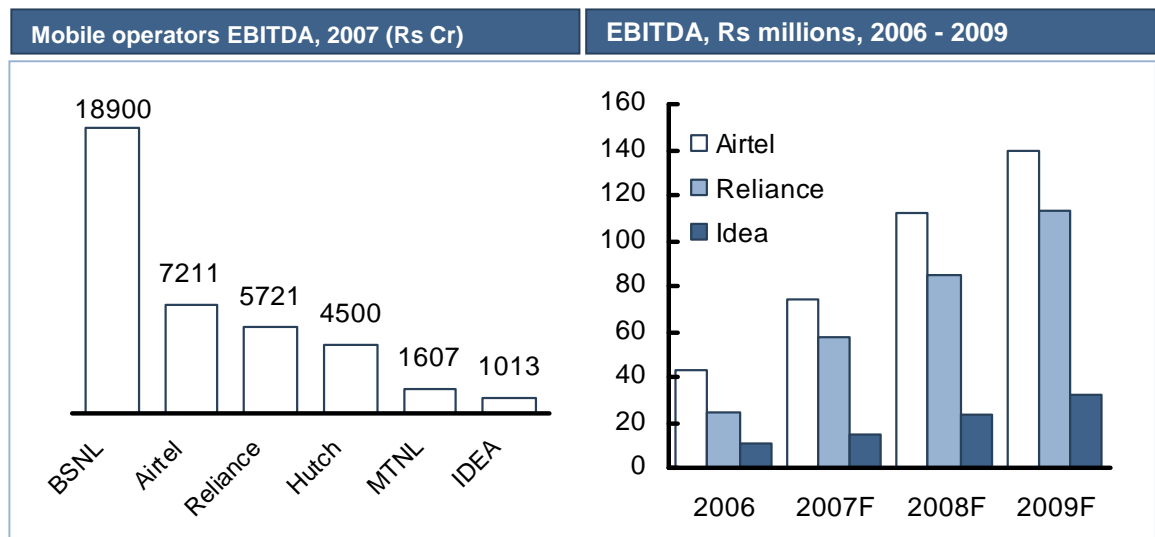
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Exhibit 23: Overall market EBITDA, 2003 – 2006 (%)



Furthermore, currently all of the market players, regardless of their size, are operating profitably. They have been able to achieve this increase in profitability, despite downward price pressure driven by increased competition in the sector. Analysts expect that the leading operators will continue to experience growth in profitability in the next three years.

Exhibit 24: Profitability of players



Source: www.moneyport.com, COAI, JP Morgan, Credit Suisse, Lehman Brothers, Spectrum / Value Partners analysis

High growth rates in the Indian mobile sector have resulted in the Indian mobile industry exhibiting one of the highest market valuations in the world (both as a ratio of earnings and as a ratio of ARPU). In addition to high valuations, the industry shows lesser gearing than many other sectors in India and lower gearing compared to

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telecom companies globally. A combination of high market valuation and low gearing implies that most mobile operators in India would be in a position to raise capital (through debt or additional equity) at a fairly low cost of capital. This would in turn imply that the financial cost of network investment in India, be it for capacity relief (through cell splitting) or for coverage expansion, would be lower than most countries in the world.

1.4.4 **There are benefits and risks of increased competition**

The consultation correctly alludes to the fact that there is an 'introverted U' relation between competition and innovation¹. Whilst Spectrum Value Partners would agree that in some more developed markets this is potentially the case, we would argue that, the Indian mobile market is currently at the early stages of the growth phase, with the majority of the 'wireless roadmap' still to come. All operators, even when submitted to fierce competition will be required to innovate due to the rapidly changing nature of the market.

The TRAI Consultation document also argues that '*introducing more operators may have a negative impact on the quality of the service and introduction of new value added services that require additional investment on infrastructure*'². Whilst Spectrum Value Partners would agree that there should still be a concerted effort from the regulator to ensure that India does not become a 'high-growth, low-quality market' we do not feel that this risk should be mitigated by limiting competition in the market because:

- Firstly, there is no reason why restricting competition in a high demand, low supply market will do anything to improve the quality of service offered by operators in the short term
- Secondly, in the long term, increased competition in the sector, will drive the requirement for all operators to provide superior service in order to maintain and gain market share
- Thirdly, whilst mobile number portability has not been introduced to date, the market already experiences high churn rates, demonstrating the customer's appetite to seek the best service provider. Should the regulator make a decision to introduce mobile number portability then this will further increase the opportunity for consumers to pick and chose.
- Fourthly, there currently appears to be hardly any difference between various operators in terms of customer propositions, tariffs, loyalty programmes or quality of service. Any scheme (e.g. "lifetime" pre-pay) or tariff is copied by other operators within weeks, if not in days. Increasing competition in the sector will force operators to differentiate
- Finally, an increase in the number of operators, and diverse service offerings is more likely to appeal to a wider selection of market segments, thus further accelerating the rate of mobile penetration growth

1.4.5 **Conclusion**

The Indian mobile market is one of the largest worldwide and is experiencing rapid growth. It is already displaying a healthy level of competition, with all operators displaying positive EBITDA. New entrants have successfully gained market share, despite the presence of established operators. A number of the leading operators are forecast to experience increasing profitability in the forthcoming years.

Spectrum Value Partners believes that due to the expected rapid and sizable growth of the market, the Indian mobile market is likely to be able to sustain additional competition.

¹ 6.14 Consultation document – 'initially competition and innovation increases with an increase in the number of operators. However after crossing the optimum point, addition of new operators adversely affects innovation by unduly intense competition

² 6.16. 'introduction of additional service providers would push up the competition for market share without any linkage to improvements in QoS

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Whilst it is fair for TRAI to recognise that there are potential risks associated with opening up the market to full competition Spectrum Value Partners argues that the potential advantages to be gained from increased competition in the sector significantly outweigh the risks and market forces will determine the most efficient level of competition for the sector.

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1.5 Regulation that prevents technology choice effectively caps competition

Globally, developed regulators are increasingly moving towards technology neutral approaches and the use of market mechanisms for the allocation of spectrum. The theory is that markets forces should be allowed to prevail where it is in the best interest of citizens and consumers. This is particularly the case in a market such as telecommunications where the rate of technology and market change is greater than the ability of regulators to amend policy frameworks. As discussed in section 1.1.1, any approach by regulators which involves allocating spectrum whilst attempting to determine the likely use of spectrum is inflexible and inefficient in a competitive market. It does not allow operators to make decisions based upon their own individual circumstances and requirements and there is less scope to acquire additional spectrum for valuable applications or to adopt cheaper alternatives.

Additionally, any regulation which prevents technology choice or is biased towards a particular technology choice will create inequalities elsewhere as additional spectrum will be required to accommodate other technologies. Inequality in effect implies favouring some industry players at the expense of the rest – this significantly raises the risk of judicial representations and litigation which delays market reform, invites bad publicity and is a cost to both the regulator and the industry.

Technology neutrality is an important consideration in allocating spectrum. To be considered technology neutral, regulatory agencies maintain policies and incentives that are technology agnostic. A regulatory test for technology neutrality is a check on whether a service provider has the flexibility to select the technology that makes the best commercial sense without interference from the regulator. International precedence suggests that operators be given the freedom to choose either any or a combination of technologies.

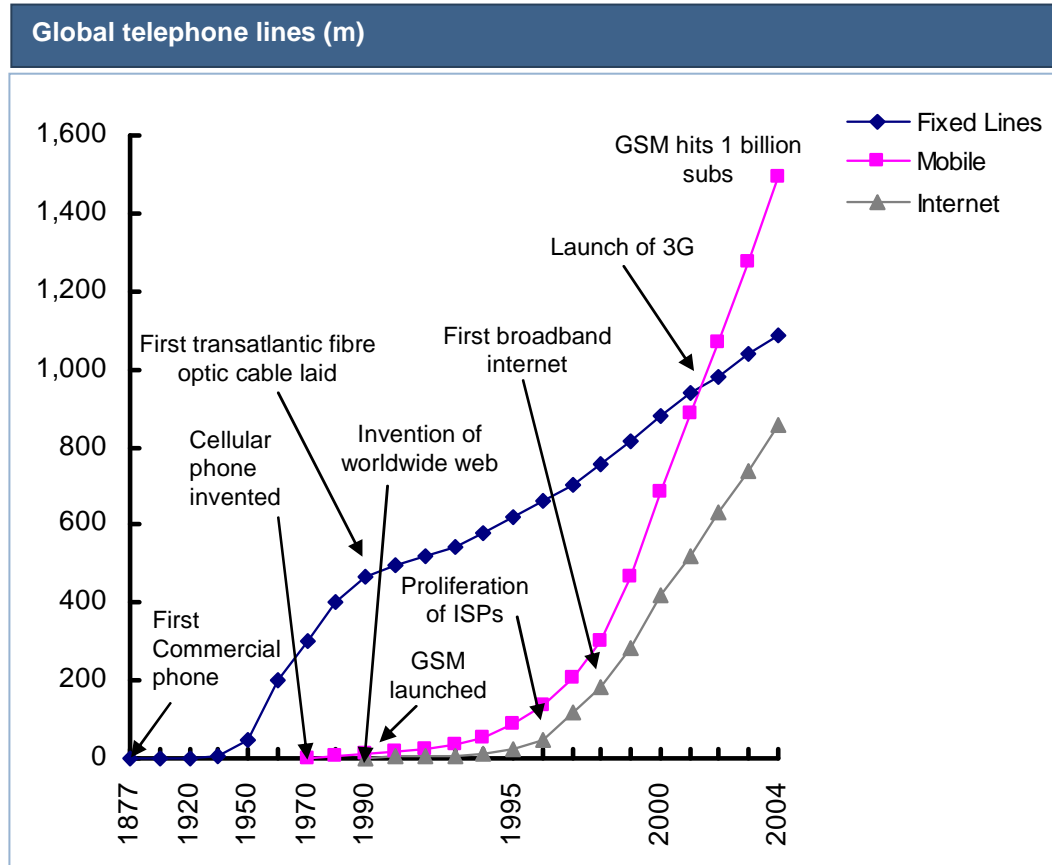
On the basis that market forces should be used wherever possible to allocate and assign spectrum, a technology-neutral auction process is preferable.

1.5.1 Regulators should not seek to pre-empt technology trends

The rate of technology change and adoption in the telecommunications industry makes it very difficult for regulators to keep pace with the rate of evolution.

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Exhibit 25: Global telephone lines¹



It is very difficult for the regulator to pre-empt technology trends and develop the appropriate policy framework. Historically, the general approach adopted had been for the regulator to decide on both the use of a particular band and which users are allowed to transmit in the band. In the US, such decisions were increasingly subject to legal challenge leading initially to the use of lotteries to overcome this problem and then eventually to the use of auctions.

Putting regulatory impediments to technology choice is effectively regulation that restricts the play of market. Provided there is availability of spectrum, any move to restrict operators to a technology, irrespective of choice of technology previously made will be a step against technology choice. This can have disastrous consequences on the development of a technology within a market. Examples of technologies which have developed at a quicker rate than the accompanying policy framework includes VoIP, web based media applications and unlicensed wireless broadband applications.

Globally, developed regulators are accepting this and are increasingly moving to the allocation of spectrum through market forces and allocating it on a technology neutral basis. The US, Australia and New Zealand are example of markets which have adopted this approach for a number of years now. The UK has also decided to go down this path following the Spectrum Framework Review in 2004. Ofcom's spectrum vision is described ion the exhibit below.

¹ ITU, Spectrum analysis

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Exhibit 26: The Ofcom Spectrum Vision¹

1. Spectrum should be free of technology and usage constraints as far as possible. Policy constraints should only be used where they can be justified;
2. It should be simple and transparent for licence holders to change the ownership and use of spectrum; and
3. Rights of spectrum users should be clearly defined and users should feel comfortable that they will not be changed without good cause.

The United States is widely recognised as a global leader in its approach to spectrum management and generally takes a technology-neutral approach. The US Congress authorized the FCC to allocate spectrum for flexible use (in 1993) when it:

- Will be in the public interest;
- Will not deter investment in communication services, systems and technology developments;
- Will not result in harmful interference; and
- Is consistent with international agreements

Since the FCC has allowed mobile operators to freely use spectrum for different technologies. Where applicable, operators have been able to use the same spectrum when migrating from legacy technologies (i.e. AMPS, TDMA) to newer technologies (GSM, CDMA, 1xRTT) and they are not barred from using multiple technologies. The recent auction for Advanced Wireless Services (AWS) (Aug 2006) is good example of spectrum which has been auctioned off for flexible use. The winning bidders are not obliged to use the spectrum for 3G technologies, but are able to decide whether they want to use the spectrum for other digital services.

In South America, there have been a number of instances of operators being allowed to use a variety of technologies to target different types of customers/ services. This includes Vivo in Brazil, Telefonica in Mexico and Telefonica in Chile.

For example, in Brazil, both in the first licencing regime and particularly post 2003, the regulator has taken a technology neutral view and has allowed operators the freedom to choose their technology upgrade path. In the 1999-2001 period, Anatel did not interfere or bias the technology decision of operators migrating from analogue or TDMA cellular to GSM or CDMA and using both. Similarly, post 2003, it has taken a technology neutral approach to operators migrating from CDMA to GSM. Vivo has launched a GSM overlay in their existing spectrum. Today, Vivo has, in some regions like the centre of the country (Region II), four technologies in the same spectrum: Amps, TDMA, GSM and CDMA.

Finally, international regulators are increasingly looking at spectrum trading that has been allowed to further reduce the regulatory intervention impact from historical licensing and further strengthen the impact of market forces on deciding level of competition. In Australia, spectrum licences are full tradable and technology neutral.² Spectrum licences authorize the use of spectrum and licensees are free to use any device and

¹ Ofcom website

² Radiocommunications Act 1992, Act No. 174 of 1992, as amended

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technology within their spectrum, provided that such devices comply with the conditions of the licences and the advisory guidelines established for the corresponding bands.

Exhibit 27: Spectrum trading guidelines¹

Spectrum – Secondary trading		
Country	Secondary Trading is allowed	Change of Spectrum Use Permitted on Transfer
El Salvador	✓	
Australia	✓	✓
Bulgaria	✓	
France	✓	
Hungary	✓	
Ireland	✓	
Poland	✓	✓
Slovenia	✓	
Spain	✓	
Sweden	✓	
United Kingdom	✓	✓

In India, TRAI has also moved to allocating mobile licences on a technology neutral basis. The license permits the use of any recognized technology for the provision of mobile service. However, DoT has identified certain specific bands for the TDMA/CDMA technologies and the spectrum is allocated to the licensee on the basis of technology specified. Further, the amount of spectrum which is to be prescribed to the operator is based upon a pre determined subscriber base criteria formula which is different for GSM and CDMA. This is unique amongst global regulators and effectively implies that spectrum is not fully technology neutral. The implications are discussed in greater detail in the next section.

1.5.2 Conclusions

Spectrum Value Partners' view is that in no circumstance should the regulator attempt to pre-empt any technology trends when allocating spectrum. Developed international regulators are increasingly of the view that operators should be given the freedom to choose the appropriate access technology for any

¹ ICT Regulation Database

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particular spectrum band. Spectrum Value Partners' view is that regulators should allocate spectrum through market mechanisms (i.e. auctions) and that it should be allocated on a technology neutral basis.

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1.6 Spectrum constraints can be managed through network planning and innovation

The substantial growth in the number of Indian mobile subscribers and the increase in mobile access providers mean that spectrum, which is a scarce resource, is increasingly becoming heavily contested.

The current method of spectrum allocation in India is unique globally in that it is based upon subscriber numbers for a pre-defined technology. The use of a subscriber base criteria formula to determine the amount of spectrum allocated to a licensee means the allocation of spectrum is not strictly technology neutral as different amounts are allocated based on the underlying technology. Additionally it does not promote spectrum efficiency in the same way as an auction.

Spectrum requirements in any territory are determined by the requirements to serve in the densely populated areas. In India, this would translate to spectrum requirements in the key Metros and cities. Using the innovations mentioned above, which are now available, greater spectrum efficiency can be attained than what has been possible in the past. Regulatory policies should enforce criteria which brings in greater spectral efficiency and possible caps.

Currently the operators have substantially more subscribers than the allocated subscribers defined in the subscriber base criteria formula in the metros. Despite this, the spectrum made available has in fact proved to be sufficient to date and this is confirmed by the Quality of Service ("QoS") which illustrate that the majority of the service benchmarks are being met and exceeded by most of the operators and this is particularly true in the Metros as well.

The availability of spectrum has key implications for TRAI as it will need to decide whether to allocate spectrum for capacity relief or to encourage new entrants and drive competition.

However prior to any spectrum being provided for capacity relief, TRAI needs to ensure that licensees are sufficiently incentivised to ensure spectrum is used efficiently. Licensees have a wide range of initiatives at their disposal to mitigate spectrum constraints. These include, but are not limited to, the following:

- Regulatory initiatives such as encouraging active sharing and indoor GSM sharing (for metro areas)
- Adaptive Multi-Rate (AMR) - audio data compression scheme optimized for speech coding which is now widely used in GSM
- Half duplex allowing for more efficient non-simultaneous communications
- Cell splitting using low power microcells

A potential option to incentivise spectrum efficiency in the Indian environment would be to allocate a cap to the amount of spectrum an operator can use. Currently the maximum allocated spectrum is 2x10MHz to any operator and has proven sufficient. The incremental capex needed for cell splitting on account of a spectrum caps can be reduced through infrastructure sharing, which the regulator should promote.

Finally, the fact that spectrum is a scarce resource means it also has implications in terms of ensuring there is fair competitive access. As discussed in section 1.2, regulatory intervention is required to prevent the threat of market dominance and therefore guidelines will need to be put in place to ensure that access to spectrum is on fair and transparent terms.

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1.6.1 QoS levels indicate that the allocated spectrum of 10MHz is sufficient even following a significant increase in subscribers

Currently the spectrum assigned to a licensee using technology varies from 2x4.4 MHz to 2x10MHz¹. To determine the amount of spectrum to be allocated to an operator within a particular circle a subscriber base criteria formula is utilised. This formula has different ratios for GSM and CDMA.

The current method of allocation of spectrum is unique globally in that it is based upon subscriber numbers for a pre-defined technology. The use of a subscriber base criteria formula to determine the amount of spectrum allocated to a licensee means the allocation of spectrum is not strictly technology neutral as different amounts are allocated based on the underlying technology. Additionally it does not promote spectrum efficiency in the same way as an auction.

Currently no operator has more than 2x10MHz, though a number of operators in selected circles have substantially more subscribers than the allocated subscribers for the 2x10MHz defined in the subscriber base criteria formula. Most market commentators, operators and TRAI have all stated that additional spectrum is therefore required in certain circles – particularly the metro areas. However, the 2x10MHz has actually been sufficient to date even for areas with far more subscribers than was intended by the subscriber allocation criteria. This would indicate that TRAI need to revisit the formula when allocating new spectrum.

This is further confirmed by the Quality of Service (“QoS”) which illustrate that the majority of the service benchmarks are being met and exceeded by most of the operators. This is despite the fact that in a number of areas, the current subscriber base criteria formula stipulates that operators should have access to more spectrum (up to 2x15MHz for GSM) based on current subscriber numbers. The QoS results are captured in the table below.

¹ For GSM the maximum is greater than the supposed contracted spectrum which is 2x6.2MHz for GSM

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Exhibit 28: Quality of Service results¹

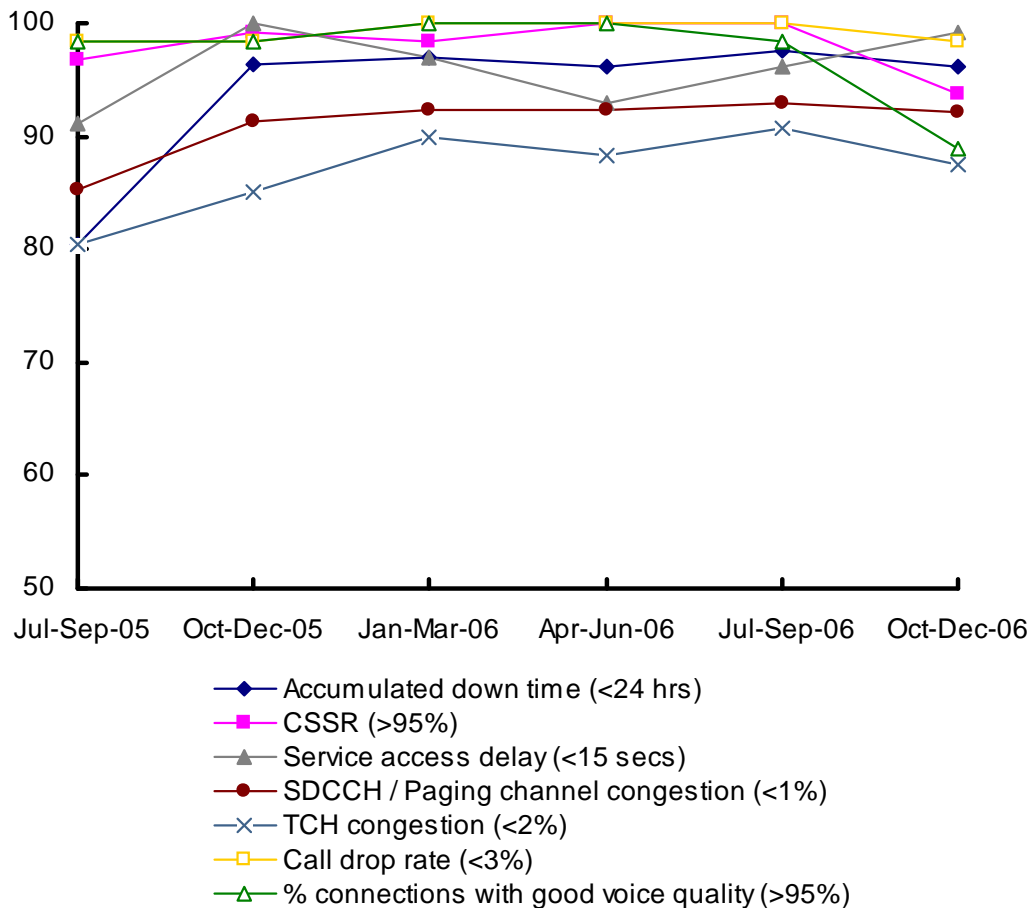
Parameters	Benchmarks	No. of Operators meeting the benchmarks	
		Quarter ending Sept 2006	
		Out of 129 (nos.)	Out of 129 (%)
Accumulated down time Community isolation	<24 hours	126	97.67%
Call Set up Success Rate (Within licensees own network)	>95%	129	100.00%
Service access delay	<15 seconds	124	96.12%
Blocked call rate <ul style="list-style-type: none"> SDCCH/paging channel congestion TCH congestion 	<1%	120	93.02%
	<2%	117	90.70%
Call drop rate	<3.0%	129	100.00%
% of connections with good voice quality	>95%	127	98.45%

What is even more interesting is that TRAI's network QoS norms have been met (most norms have actually improved) even as the number of subscribers has gone up at an exponential rate in the last few years. This has happened despite no additional spectrum being assigned to operators (apart from that assigned to new entrants in some circles). This apparent independence of QoS norms with subscriber numbers for the same amount of assigned spectrum suggests that, in the Indian market at least, meeting network QoS is not a direct function of the amount of spectrum an operator has. Rather it is a function of network planning, network capex, technology innovation and quality of service management. It appears that Indian mobile operators have done a highly commendable job in meeting this tremendous subscriber growth within the spectrum assigned.

¹ TRAI

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Exhibit 29: % of Indian mobile operators meeting TRAI QoS benchmarks



1.6.2 ***There are a number of initiatives which would improve spectrum efficiency and mitigate future spectrum constraints***

Our analysis would therefore suggest that existing spectrum allocations is therefore sufficient based on current subscriber numbers.

Based on the current market structure, capacity issues in some areas may occur due to aggressive future subscriber growth. However, there are a wide range of initiatives which will enable more efficient use of allocated spectrum. These include, but are not limited to, the following:

- Active sharing
- Indoor GSM sharing (for metro areas)
- Further technology innovation such as:
 - adaptive Multi-Rate (AMR) - audio data compression scheme optimized for speech coding which is now widely used in GSM
 - half duplex allowing for more efficient non-simultaneous communications
 - IP core migration improving network efficiency

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- Cell splitting using low power microcells – this will be required largely for metro areas such as Mumbai, Delhi and Chennai. This will require further investment in network infrastructure in the form of new base stations, though capex outlay will be limited

Additionally, the upcoming allocation of 3G spectrum will enable operators to significantly increase the amount of capacity it has at its disposal. The rollout of 3G, whilst likely to take time, will allow operators to migrate higher value and high usage customers to 3G reducing capacity pressures on 2G networks. 3G roll out will also occur first in areas (metro areas) of greatest 2G capacity constraints.

Under the current spectrum allocation methodology, licensees are not fully incentivised to improve spectrum efficiency, as they are supposed to receive additional spectrum as their subscriber base grows. However by placing a cap on the amount of spectrum allocated this will further incentivise licensees to invest in initiatives which will help improve spectrum efficiency. Currently, spectrum is effectively capped at 2x10MHz and has proved sufficient to date.

1.6.3 ***The regulator therefore needs to balance the requirements of new entrants with providing future capacity relief when allocating new spectrum***

The Government has made it clear that it will also allocate new spectrum both for GSM and CDMA purposes in the near future. It is thought that 2x20MHz will be made available in the 1800MHz and could be used for either future capacity relief in dense urban areas or for new entrants. The amount of 2G spectrum likely to be made available is highlighted in the exhibit below.

Exhibit 30: Future 2G spectrum availability in India

Spectrum band	Timeframe	Available spectrum	Service provider
2.1GHz	6-9 months	2 x 25	GSM for 3G ¹
1800MHz	6-9 months	2 x 20	GSM for 2G
900MHz	12-15 months	2 x 4.8	GSM for 2G ²

Note: (1) 2 x 3.75MHz can be allocated to CDMA operators (2) All circles except Delhi and Mumbai
Source: Morgan Stanley

If you assume that the existing maximum spectrum allocations of 10MHz per operator is sufficient for current subscriber projections, then it is feasible that any excess spectrum could be utilised to support new entrants in the Indian market.

The allocation of any new spectrum should therefore be the balance of the requirement for any future capacity relief versus supporting new entrants in the 2G space.

Spectrum Value Partners' view is that the existing maximum spectrum allocation of 2x10MHz per operator is sufficient for all circles based on current subscriber numbers. Whilst future subscriber increases will potentially place spectrum constraints in a number of circles across India, operators have a wide range of initiatives to improve spectrum efficiency and mitigate any impact. Some new spectrum could be provided to mitigate capacity constraints by allowing all GSM operators up to 2x10MHz.

However there is likely to be sufficient spectrum remaining to allow a number of new entrants. As discussed in section 1.3, India still has the capacity for additional competition in the mobile sector and consumers would

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benefit further. Additionally, there are a number of precedents globally, in which regulators have allocated spectrum (both 2G and 3G) with a view to encouraging new entrants in the market to further drive competition. Any new spectrum which is to be provided for new entrants should be allocated based on market mechanisms and on a technology neutral basis (see section 1.5).

1.6.4 The spectrum limit for merged entities should remain at 2x15MHz

Similarly, the fact that spectrum is a scarce resource means it also has implications in terms of ensuring there is fair competitive access. As discussed in section 1.2, regulatory intervention is required to prevent the threat of market dominance and therefore guidelines will need to be put in place to ensure that no one provider can dominate spectrum holdings whilst also ensuring that access to spectrum is on fair terms.

Current guidelines stipulate that any merged entity will be able to retain 2x15MHz of 2G spectrum. If you assume that the spectrum cap for a single entity is capped at 2x10MHz, then 2x15MHz is a sufficient amount of spectrum and would enable the merged entity to service a large number of subscribers. The merged entity would also benefit from spectrum efficiency delivered as a result of any merger and is also likely to have access to significant amounts of 3G spectrum. Migration of high value customers in metro areas in particular will help to mitigate future 2G capacity concerns. Spectrum Value Partners therefore recommends that the spectrum limit for a merged entity be capped at 15MHz.

To ensure consistency with allowing market mechanisms for the efficient allocation of spectrum on a technology neutral basis, the merged entity cap should be applicable irrespective of the intended use of the spectrum. As discussed in section 1.5, developed regulators are increasingly adopting a technology neutral approach and one in which the use of spectrum can be changed upon transfer.

1.6.5 Conclusions

The substantial growth in the number of Indian mobile subscribers and the increase in mobile access providers mean that spectrum, which is a scarce resource, is becoming increasingly heavily contested. Despite this the spectrum made available has in fact proved to be sufficient to date and this is confirmed by QoS results.

The availability of spectrum has key implications for TRAI as it will need to decide whether to allocate spectrum for capacity relief or to encourage new entrants and drive competition.

From a market forces perspective, the most efficient mechanism to allocate spectrum is through an auction. However, as the current mechanism to allocate spectrum in India is not through auctions, TRAI needs to look at other ways to increase spectrum efficiency under the current subscriber numbers based formula. A potential option to incentivise spectrum efficiency in the India environment would be to allocate a cap to the amount of spectrum an operator can use. Spectrum Value Partners' view is that the existing maximum spectrum allocations of 2x10MHz per operator are sufficient for all circles based on current subscriber numbers. This would also allow sufficient spectrum for a number of new entrants. India still has the capacity for additional competition in the mobile sector and consumers would further benefit. Any new spectrum which is to be provided for new entrants should be allocated based on market mechanisms and on a technology neutral basis.

Finally, Spectrum Value Partners recommends that the spectrum limit for a merged entity be capped at 15MHz. To ensure consistent with allowing market mechanisms for the efficient allocation of spectrum on a technology neutral basis, the merged entity cap should be applicable irrespective of the intended use of the spectrum.

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1.7 Regulation should not impede consolidation that does not result in dominance

Regulatory intervention should not prevent the market from determining the level of competition provided there is no risk of market dominance. Thus, if a possible within-sector consolidation is below the market dominance thresholds, regulation should not prevent it. Spectrum Value Partners believes that market forces will be the best determinants of efficient competition within the sector.

1.7.1 Market forces are the best judge of consolidation

As previously discussed, market forces are the best judge of effective competition in a sector and are likely to contribute to consolidation in the long-run. Spectrum Value Partners holds by its argument that intervention by the regulator can be counter-productive in a rapidly evolving market.

The Indian market displays a healthy level of competition, with a number of operators providing services in each circle. It has reached a stage of development where, unless a consolidated company has a greater than accepted threshold for dominance (i.e. greater than 35-40% market share), in sector consolidation will not impact the market structure, but rather should be viewed as a natural evolutionary process driving market development.

1.7.2 Current regulation appears to prohibit market consolidation and is not necessary in the contemporary Indian market

Present licence conditions restrict the number of licensees in which any company / legal person can have substantial equity holding in, through direct or indirect means. This is an attempt to prevent market collusion amongst operators, particularly surrounding issues of pricing, which would lead to unfair competition in the market through the formation of 'trust' or anti-competitive cartels.

At present a substantial equity holding is defined as 10% of the equity of the licence company. This is specific to telecommunications. This level is particularly low and restrictive to natural consolidation. In other industries, substantial equity is declared above a much higher threshold (e.g. 25%).

All operators are currently experiencing high levels of profitability and are expected to experience further growth in the future. In most cases, promoters have a majority share in the operator. Spectrum Value Partners expects that it is not likely that any of these promoters would wish to exit the highly lucrative market especially with such strongly anticipated growth potential ahead. For this reason, we believe that a 100% buy out is unlikely.

Based on the assumption that a 100% buy out is unlikely, and also assuming no dilution, the current strict regulations placed on cross-holding will prohibit the majority of within-industry mergers from taking place. This is due to the substantial equity holding that the majority of leading promoters have in their own companies meaning that the acquisition of one company by another will result in any single equity holder having more than 10% equity in both companies.

1.7.3 Consolidation will be sufficiently regulated by controls on dominance, spectrum caps and number of access providers per licence area

Spectrum Value Partners believes that the regulation of the three key issues detailed in this submission, will be sufficient to prevent collusion in the market. These are:

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- Regulating abuses of dominance – the regulator should either prevent mergers resulting in a company having more than 35-40% market share, or should take action to regulate their operations
- Allocating spectrum caps of 15Mhz for merged entities
- Ensuring a minimum of 3 operators in each licence area

These ex-post recommendations will be sufficient to ensure that anti-competitive behaviour in the sector is prohibited. Beyond this, TRAI should relax their approaches to the regulation of cross-holdings.

1.7.4 The regulator should not discourage consolidation

Spectrum Value Partners recommends a policy framework be applied which promotes competition, mergers, consolidation and investment in the sector. These will occur at a time which is most suited to the current market requirements. Such market consolidation is currently restricted by the strict regulations in place.

Spectrum Value Partners believes that these restrictions hinder market development and should be relaxed. As is the case with a number of international regulators, TRAI should maintain the power to intervene should issues of collusion or non-competitive conduct should arise. However, generally they should leave consolidation to market forces.

This ex-ante approach is commonly adopted amongst leading regulators worldwide. Furthermore a number of guidelines preventing anti-competitive conduct can also be written into licence conditions, as is the case in Singapore and the UK.

Exhibit 31: Handling of some non-competitive issues in Singapore and the UK

Issue	iDA approach (Singapore)	Ofcom approach (UK)
Price Fixing	<ul style="list-style-type: none"> • ‘... licenses must not enter into agreements to fix prices or restrict output, regards of the levels to which the Licensees agree ...’ 	<ul style="list-style-type: none"> • ‘... Agreements between undertakings, decisions by associations of undertakings or concerted practices ... are prohibited ... [and] applies, in particular, to agreements, decisions or practices which ... directly or indirectly fix purchase or selling prices or any other trading conditions ...’
Bid rigging (at auction)	<ul style="list-style-type: none"> • “...Licensees must not enter into agreements to co-ordinate separate bids for assets, resources or rights auctioned by IDA, or for any input into the Licensee’s service or for the provision by the Licensee of any telecommunications service or equipment, regardless of the price levels to which the Licensees agree...” 	<ul style="list-style-type: none"> • “...A bidder, any member of that Bidder’s Candidate Group or its Insiders, shall not convey or attempt to convey or incite another person to convey any Confidential Information, whether directly or indirectly, to any other Bidder or member of that other Bidder’s Candidate Group or enter into or attempt to enter into any arrangement, agreement or understanding for that purpose...” (ref to 3G auction)
Collusion	<ul style="list-style-type: none"> • ‘... Licensees are prohibited from entering into agreements not to compete to provide telecommunication services or equipment to specific End Users or not to compete in specific areas, regardless of the terms and conditions on which the Licensees agree ...’ 	<ul style="list-style-type: none"> • ‘... Agreements between undertakings, decisions by associations of undertakings or concerted practices ... are prohibited ... [and] applies, in particular, to agreements, decisions or practices which ... share markets or sources of supply ...’

Source: IDA Code, UK Competition Act, Ofcom, Spectrum analysis

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Spectrum Value Partners recommends, therefore that TRAI follows international best practice in this instance. Firstly they should prohibit anti-competitive conduct through licence conditions. Secondly they should review any potential cross-holdings on a case by case basis to verify that there is no indication of collusion. They should not, however, impose regulations prior to consolidation that would restrict the natural evolution of the market.

1.7.5 Conclusion

Our recommendations for the relaxing of regulation around cross-holding strongly support a number of the key arguments surrounding competition as presented in this submission:

- Competition is good and has helped the market grow; Spectrum Value Partners believes that the market is capable of sustaining further market competition
- Competition controlled by market forces is a much better judge of competition; non-market intervention will be counter productive and may work against consumer interests and market development
- Regulation that prevents non-dominant access providers from consolidating will be against the mantra of letting market forces decide
- **Therefore, Spectrum Value Partners recommends that the current equity cross-holding limitation of 10% should not be applied indiscriminately to all mergers, as due to the ownership structure in the market it prevents consolidation amongst players**
- In order to prevent collusion the regulator may wish to prohibit anti-competitive conduct as part of the operator licence conditions and review consolidation on a case by case basis. They should not impose restrictions prior to this.
- However, the regulator should not allow any market activity that risks market dominance or abuse of this dominance. Dominance should be declared if a single entity has a 35-40% market share
- Allocating spectrum caps for merged entities and ensuring that there are always a minimum of three access providers per licence area will also help to ensure that consolidation in the market occurs at a time which drives the most efficient level of competition

2 Specific answers to submission questions

Our response to the TRAI consultation is based on Spectrum Value Partner's own knowledge and experience in competition and regulatory issues within the global telecommunications market. Spectrum Value Partners has significant experience working with leading operators, regulators and financial institutions advising them on regulatory and policy issues both in India and international markets.

Spectrum Value Partners' submission focuses on a number of the most important questions raised in the TRAI consultation paper. The consultation paper represents a significant milestone in terms of Indian policy framework.

Q1. How would the market in the access segment be defined (see 2.22)?

- In Spectrum Value Partners' view, the definition of markets should continue to be based on fixed and mobile separately. Both markets exhibit different characteristics and are at significant different stages of growth
- A separate definition of the fixed and mobile markets is a standard practice in developed global markets

Q3. As per the existing guidelines, any merger/acquisition that leads to a market share 67% or more, of the merged entity, is not permitted. Keeping in mind, our objective and the present and expected market conditions, what should be the permissible level of market share of the merged entity? Please provide justifications for your reply.

- Spectrum Value Partners' view is that the current guideline of the permissible level of market share for a merged entity of 67% is too high to be in anyway meaningful
- A more appropriate threshold should be in the region 35-40% based on current and forecasted level of competition in the Indian mobile market and international best practice
- The India mobile market now has a significant number of competing mobile players, with no operator approaching a level that could be defined as 'dominant' on a national basis. Since the level beyond which an operator is seen as dominant is currently set at such a high threshold, it is too high to be meaningful. For example, even mergers between the two leading operators would not result in a 'dominant' operators as per current definitions
- Spectrum Value Partners' view is that consolidation is an essential requirement for the continued development of the Indian telecoms market, and should not be entirely prevented
- However, with current 'dominance levels' set at 67% there appears to be a real risk of market dominance if market leaders merge and this should be regulated to ensure efficient growth of the market

Q4. Should the maximum spectrum limit that could be held by a merged entity be specified?

- a. If yes, what should be the limit? Should this limit be different for mergers amongst GSM/GSM, CDMA/CDMA and GSM/CDMA operators? If yes, please specify the respective limits?
- b. If no, give reasons on view of effective utilisation of scarce spectrum resource.

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- Spectrum Value Partners agrees that guidelines still need to be put in place to ensure that no one provider dominates spectrum holdings in any given service area
- Spectrum Value Partners recommends that the existing spectrum threshold for merged entities of 2x15MHz be maintained but should be applicable for all service areas
- This represents a significant proportion of the currently available spectrum and will enable operators to service a large number of subscribers.
- As discussed in section 1.6.2, operators have a number of initiatives at their disposal (such as efficient network planning and technology innovations) to help mitigate the impact of capacity constraints
- Additionally, any future merged entity is also likely to have access to significant amounts of 3G spectrum
- To ensure consistency in terms of allowing market mechanisms for the allocation of spectrum on a technology neutral basis, the merged entity cap should be applicable irrespective of the intended use of the spectrum.

Q5. Should there be a lower limit on the number of access service providers in a service area in the context of M&A activity? What should this be, and how should it be defined?

- Spectrum Value Partners' view that the current check of at least three access providers in a circle is a good measure of competition and should not be amended
- Ensuring a high level of competition in each region has proven to be a successful contributor to mobile take-up

Q6. What are the qualitative or quantitative conditions, in terms of review of potential mergers or acquisitions and transfers of licences, which should be in place to ensure healthy competition in the market?

- As discussed in the submission there are a number of wide ranging conditions which the regulator should have in place to ensure healthy competition and to prevent market dominance
- Spectrum Value Partners' view largely stems from the well accepted belief that level of competition in a market should be left to market forces unless there is a risk of abuse of market dominance
- The key quantitative and qualitative conditions which would help prevent the abuse of market dominance captured in the submission includes the following:
 - there should be at least three access providers within a circle
 - permissible level of market share for a merged company of 35-40%.
 - existing spectrum threshold for merged entities of 2x15MHz be maintained
 - cross holding restrictions should be removed where it is clear that the motive is consolidation and not operator collusion

Q7. As a regulatory philosophy, should the DoT and TRAI focus more on ex post or ex ante competition regulation, or a mix of the two? How can such a balance be created?

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- Spectrum Value Partners' view is that DoT and TRAI should maintain the existing ex-ante regulatory approach
- This is largely based on the fact that the Indian mobile market has not yet fully developed and is still growing at a substantial rate

Q15 In view of the fact that in the present licensing regime, the initial spectrum allocation is based on the technology chosen by the licensee (CDMA or TDMA) and subsequently for both these technologies there is a separate growth path based on the subscriber numbers, please indicate whether a licensee using one technology should be assigned additional spectrum meant for the other technology under the same license?

- Spectrum Value Partners' view is that regulators should not seek to pre-empt any technology trends
- Developed international regulators are increasingly of the view that operators should be given the freedom to choose the appropriate access technology or combinations for any particular spectrum band
- Accordingly, additional spectrum as per technology choice of operator should be allocated under same license

Q16 In case the licensee is permitted, then how and at what price, the licensee can be allotted additional spectrum suitable for the chosen alternate technology;

- In Spectrum Value Partners' view the use of market mechanisms (i.e. auctions) is most appropriate for the allocation of new spectrum as it ensures spectrum efficiency. The theory is that markets forces should be allowed to prevail where it is in the best interest of citizens and consumers
- Considering technology neutrality, an operator can choose one or more technologies. Accordingly, in the current subscriber based allocation criteria, the price for the spectrum could be the charges for the spectrum used as per the current spectrum charges.

Q17 What should be the priority in allocation of spectrum among the three categories of licensees given in 4.16 of the chapter?

- Globally, relative priority is not an issue as auction is increasingly the preferred allocation method
- In terms of the Indian context, TRAI needs to incentivise spectral efficiency and competition through the use of market mechanisms and enabling new entrants

Q19 Lastly, as such service provider would be using two different technologies for providing the mobile service, therefore what should be the methodology for allocation of future spectrum to him?

- In Spectrum Value Partners' view the use of market mechanisms is most appropriate for the allocation of new spectrum.
- Since India has not been adopting the globally accepted route to award spectrum (i.e. auction), subscriber based criteria could be used for future allocations
- However, to promote greater spectral efficiency, the current subscriber based criteria should be re-examined

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Q29 Should there be a limit of number of access service providers in a service area? If yes, what should be the basis for deciding the number of operators and how many operators should be permitted to operate in a service area?

- Spectrum Value Partners' view is that market forces are the best judge of competition and international precedent and economic theory suggest that regulatory intervention is needed only if there is a risk of market power concentration and subsequent abuse of market power
- As such Spectrum Value Partners does not recommend that any limit should be placed on the number of access providers from a competitive, financial sustainability and the availability of spectrum perspective
- As noted in the submission there is evidence that the Indian mobile market appears to be able to sustain additional competition
- In terms of the availability of spectrum, in the recent times, network and technology innovations have enabled greater spectrum efficiency and as a result, the market could support additional operators. This is further confirmed by the Quality of Service ("QoS") which illustrates that the service benchmarks are being met by most of the operators with the same spectrum despite exponential customer growth.

Q30 Should the issue of deciding the number of operators in each service area be left to the market forces?

- Spectrum Value Partners' view is that market forces are the best judge of competition and international precedent and economic theory suggest that regulatory intervention is needed only if there is a risk of market power concentration and subsequent abuse of market power

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Abbreviations and glossary

ACA	Australian Communications Authority: The telecommunications regulator in Australia
ACCC	Australian Competition and Consumer Commission: The competition regulator in Australia
ACIF	Australian Communications Industry Forum: An industry body in Australia that facilitates communications self-regulation
ADC	Access Deficit Charge
ARPU	Average Revenue Per User
BSNL	Bharat Sanchar Nigam Limited
CAGR	Compound Annual Growth Rate
CDMA	Code-Division Multiple Access
DLD	Domestic Long Distance
EC	European Commission: The European Commission is the executive body of the European Union and is responsible for drafting policy and for implementing European legislation, budget and programmes adopted by Parliament and the Council
EU	European Union: A collection of 15 western European member States (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom) which are increasingly co-ordinating and standardising their policies and approaches to key issues, including economic development and competition
FCC	Federal Communications Commission: The telecommunications regulator in the United States
GMSC	Gateway Mobile Switching Centre
GSM	Global System for Mobile Communications
HHI	Herfindahl-Hirschman Index: A measure used by the United State's Department of Justice and the Federal Trade Commission to assess the level of concentration in any defined market
IDA	Info-Communications Development Authority: The telecommunications regulator in Singapore
ILD	International Long Distance
IN	Intelligent Network
MCMC	Malaysian Communications and Multimedia Commission: The communications regulator in Malaysia
MoU	Minutes of Use
MTNL	Mahanagar Telephone Nigam Limited
MVNO	Mobile Virtual Network Operator
NPV	Net Present Value
OFTA	Office of the Telecommunications Authority: The telecommunications regulator in Hong Kong
OFCOM	Office of Communications: The communications regulator in the United Kingdom
QoS	Quality of Service
RPM	Revenue per minute
SIM	Subscriber Identity Module
SME	Small and Medium Enterprise
TRAI	Telecommunications Regulatory Authority of India: The telecommunications regulator in India
UK	United Kingdom
WLL (F)	Wireless in Local Loop, Fixed

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