THREE ESSAYS ON EVOLUTION OF THE INDIAN CELLULAR INDUSTRY

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ABSTRACT

The telecommunication services sector in India has been going through a phenomenal introduction of reforms in the last two decades. This period displayed tremendous amount of competition and growth in the sector. It is universally acknowledged that the growth of competition in a well-functioning market leads to enhanced efficiency, increased innovation, reduced prices, broadened supply and encourages better customer service. Therefore, introducing competition into the telecom industry needs to be accomplished in a satisfactory manner so that the country can maximise the potential benefits. For this, right kinds of policies need to be implemented by the government to achieve growth of the industry and protect interests of the consumers as well. Various reforms have been undertaken by the government for the growth of the telecommunication industry in India. The sector has experienced a very successful growth story particularly in voice segment. However, on the broadband or data side, there is huge potential yet to be tapped. With availability of newer applications uses of telecommunication services are expanding in variety of sectors and hence it's important that this sector is developed well. In this thesis we look at the evolution of Indian cellular mobile industry and examine few of the issues in order to provide inputs on certain policy issues in the telecom sector. In the first essay we investigate whether there is any early mover advantage to players who entered the Indian mobile market early. Research in first mover advantage has primarily focused on product markets in western countries. Services are now becoming crucial in a country's development and playing an increasingly important role in the global economy. However, there are hardly any studies on first mover advantage focusing on the service industry. Indian telecom market provides a case for studying first mover advantage in a service industry with huge network effects. This essay develops the relationships between early entry and market share and tests the hypotheses using 11-year panel data from the Indian cellular market. Our finding shows that early movers have market share advantage. As there was substantial time gap between successive entries in the market due to sequential licence allotment by the government, we find that the quantum of early mover advantage increases with the time gap between successive entries in the market. Further, we also find that early mover advantage is reduced during the growth phase of the market compared to early adoption stage. Also, Impact of early mover advantage is found to be lower in high growth markets. Incumbency of state-owned operators in fixed line is seen to offset some of the disadvantage of their late entry. Based on the results we argue in favour of simultaneous licencing, rather than restricted sequential licencing, for facilitating competition and achieving faster growth. In Essay 2 we conduct an exploratory analysis of 3G Spectrum auction held in the year 2010. We first analyse the issue of setting reserve price and suggest a scientific method to set reserve price instead of setting it based on historical classification of different telecom service areas (markets) in the country. We then explore the determinants of winning prices for each of the 22 markets. Further, we investigate what factors explain the bidding behaviour of bidders and how these guided their bidding responses. In particular, we investigate the dominant strategy of the bidders and whether the bidding was straightforward; whether there is any parking strategy; signs of local synergies; and budget constraints. We build a model and test this with the bidding data for all seven winning operators. The model is able to correctly predict 94% of the bid responses. The results suggest that one of the drivers of bidding for an operator in a particular market was the revenue from existing 2G business in the concerned market and the contribution of that market to the overall revenue from all markets of the bidder. The dominant strategy, therefore, was to protect existing important markets in terms of revenue earned. Our modelling indicates furthermore, that the bidding was not straightforward; there are no signs of parking strategy adopted by bidders;

bidders, barring two, faced budget constraints; some of the bidders gave consideration to local synergy; and the bidding process is Markovian. In Essay 3 we seek to analyse the impact of 3G spectrum, which was obtained through an auction process, on the revenues of the operators. There have been numerous articles related to third generation telecommunication systems (3G) in India – first on overbidding by the operators in the 3G spectrum auctions held in 2010 and subsequently that 3G has not paid off. These reports indicate that operators paid too high a price in the auction and have not been able to compensate themselves by way of increased revenues through additional services possible from 3G. This essay examines these statements and investigates whether operators who secured 3G spectrum through auctions could generate premium from customers; and therefore, generate incremental profits from 3G services after offsetting the cost paid in the spectrum auction. The paper first analyses the impact on average revenue per user (ARPU) attributable to 3G spectrum owned by the operators. We then investigate how this premium, on account of 3G spectrum, varies by the type of market served, as operators had obtained the spectrum at varying prices in various markets. The results suggest that 3G services are able to generate premium over 2G through additional service/application usage; and therefore, provide additional revenue from the subscribers on average. Our modelling indicates furthermore, that the impact of 3G services, in terms of increase in revenue per subscriber is mainly in Metro and 'A' type markets. The net incremental impact on profit due to 3G services is also calculated for the industry. It is concluded finally that by liberalising the use of spectrum not only the government can earn more revenue; it also allows operators to use it in the best efficient way and provide new services to the customers. The size of the impact of 3G services on additional revenue generation can also be utilised in setting the reserve price for future auctions and providing an insight for spectrum management reforms including its application in other sectors