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From: **Chirantan Chatterjee** <chirantan.chatterjee@iimb.ac.in>

Date: 13 November 2017 at 12:24

Subject: Re: TRAI CONSULTATION PAPER ON PROMOTING LOCAL TELECOM EQUIPMENT
MANUFACTURING

To: BHARAT GUPTA <bharatgupta.tra@gmail.com>

Cc: "chirantan_chatterjee@isb.edu" <chirantan_chatterjee@isb.edu>, Chirantan Chatterjee
<chirantan@gmail.com>

Dear Mr. Gupta,

Please find my comments in this email. Kindly mark all your future emails to chirantan_chatterjee@isb.edu since i have now moved to the Indian School of Business as a full-time faculty member there. Good luck with the work, its very timely.

Best, Chirantan

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1. The discussion on cost of technology and its connection to low levels of telecom equipment manufacturing in India seems a bit removed from reality. The lower intensity of manufacturing in the country is not connected to the affordability of technology by the local manufacturers. Instead it can be attributed to lack of sufficient fiscal incentives, like those successfully created in countries like Brazil, China, Vietnam and Indonesia as i discuss below.

2. SSOs (standard setting organizations) have been critical in advancing and disseminating technological standards throughout the world including in India. Government of India needs to be careful about intervening in their operations in a spirit of using it as a lever for

affordability. This may create disincentives for innovation in the local context and deter entrepreneurial work in this sector impacting quality of investment. Two outcomes can be envisioned as a result. First, this will run antithetical to government's proposed vision of Make in India and Design in India and second, this might also be detrimental to security and privacy interests of the consumer, since increasingly, starting from finance to healthcare, large number of operations are going to be handled on the mobile phone as a platform. If these mobile phones are going to be designed, created and manufactured abroad with minimal or no local-Indian contribution, our dependence on high-value imports also will create strategic vulnerability to other nations that are making investments on the high-end of the quality spectrum in these devices. And in all this, it is also important to keep in mind that while telecom handset manufacturing is a sub-market within the broader market of electronic manufacturing, their evolution have been disparate and policy making should keep these distinctions in mind.

3. The reason GOI has been unable to attract more quality investments in handset manufacturing has been detailed in

OUR report (https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2874689). It is worthwhile here to learn from explicit financial incentives given in other economies to promote quality handset manufacturing. In Brazil, as part of Made in Brazil initiative, they eliminated value added taxes for products where 'critical components' were designed in Brazil - this over and above the reduced import taxes and reduced value added taxes for products produced in Brazil. In Indonesia in 2015, they announced quotas of 30% local sourcing of LTE devices starting 2017. In China, the government has made semiconductor policy as part of their national S&T policy, infact this is also aligned into China's big foray into the AI and IOT world which is the future of the world going forward. They are also focusing on agglomeration economies based on regional clusters worth pondering for GOI. Vietnam's policies on 30-year tax holidays with its own clauses are worth looking at as well. in sum, a multi-pronged approach in fiscal incentives is required to build upstream technology levered capabilities in handset manufacturing for India tomorrow.

4. For know-how: wireless cellular technologies/standards (2G, 3G, 4G,...) are very technical and complex. The first thing companies do to implement products is to send their engineers to standards bodies and start understand the specifications. As i understand, there has been no one ever from any firm in India in these meetings with 500+ companies being represented. Are our companies and public R&D institutes of excellence (IITs/IITs/IISc) then missing the bus in moving up the value chain? What is GOI's thought in this regard, especially with regard to skill development and human capital for this sector?

5. On licensing fee as an entry barrier: There seems to be a misperception that licensing fee in this industry happens at the infrastructure level. On the contrary, this paper (https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2855078) and industry practice clearly shows that it happens at the phone level. So if infrastructure makers do not have to pay a licensing fee, how can licensing represent a barrier to entry? Would be good to correct this misperception.

6. On the "smallest saleable component" as the royalty base as a way forward, it is worth examining the detrimental effects of such an action with the IEEE experience. I have written about this in an ET article (<https://blogs.economictimes.indiatimes.com/et-commentary/india-will-have-to-decide-whether-it-wants-to-get-serious-about-rd-by-taking-ipr-seriously/>) earlier, evidence now exists about its detrimental effects. As per Keith Mallinson, "IEEE decided to amend its IPR Policy deviating from the WTO principles and accepting amendments that are only pro-users. Since then, 73% of LOAs for the IEEE flagship 802.11 WiFi standard, accepted by IEEE and posted on its website in the 18-month period to June 2017, were negative" (Source: http://www.4ipcouncil.com/application/files/6015/0479/2147/Mallinson_IEEE_LOA_report.pdf). Does the GoI want to go the IEEE direction then is a question i worry deeply about?

7. India should not just be the demand crucible for mobile phone manufacturers of the world but also the supply crucible exploiting its demand side learning economies. If IPR was not good as it currently is, this would have impacted prices and choices of handsets, but i don't see that happening, so why tinker with current IPR policy? Instead, i would prefer to focus on the supply side and create upstream capabilities to become the hub of global mobile phone manufacturing at the high-end, which caters to not just evolving Indian local needs but also global needs.

8. In sum, i would recommend the following: a) Create strong fiscal incentives for local value-add b) strengthen TSDSI for contribution to standard setting process (Indian manufacturers have zero presence in international standard setting meetings which is a shame actually) c) Continue on phased manufacturing plan as implemented d) Strengthen collaborative standards development process d) Strengthen IPR and SEPs for start-ups to engage in risky R&D and to create India's global technology leverage against established players.