

Mobile Communications, the Internet and the Digital Economy: Comparisons and Lessons from some major developing countries - China, India and Mexico

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Objectives

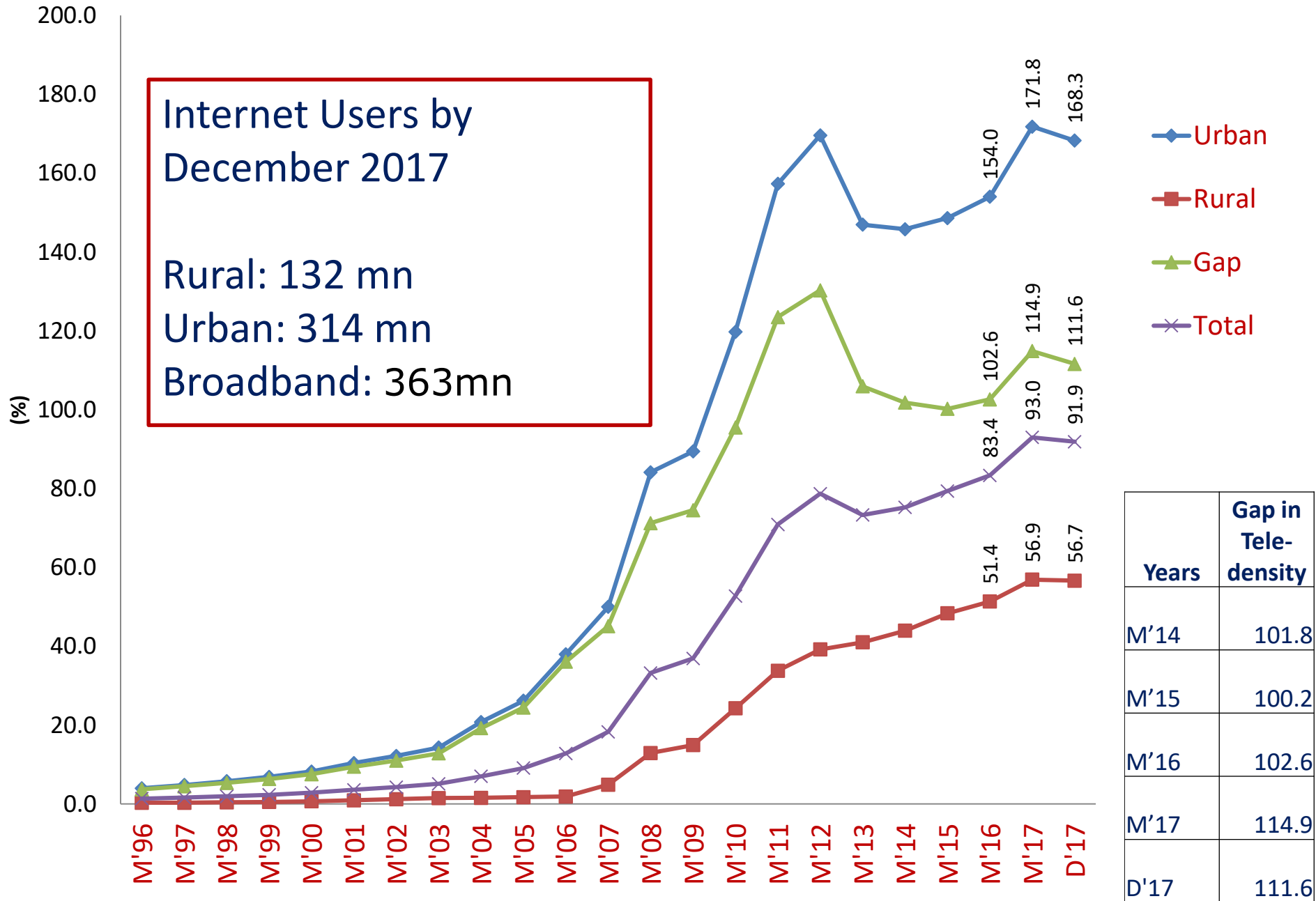
- ❑ To compare strategies being used in these countries to find out what has worked, what did not, the problems encountered and whether there are lessons to be learned that are of general applicability, as well as for particular countries.
- ❑ To explore the possibilities and limitations of learning from other nations' and regions' experiences, identifying common policy challenges and medium-term research requirements of interest.

Discussion points

- ❑ Role of mobile broadband in national broadband strategies, and its integration with wireline; urban-rural infrastructure gap and “last mile” access
- ❑ Mobile infrastructure deployment strategies in Mexico and India and role of Public Private Partnerships
- ❑ Mobile standard-setting and device manufacturing in China
- ❑ Demand side strategies to complement supply side initiatives

India – The National Scene

Teledensity Trends



Years	Gap in Tele-density
M'14	101.8
M'15	100.2
M'16	102.6
M'17	114.9
D'17	111.6

Policy Issues and Major Challenges

- Narrowing urban-rural digital divide
 - Difficulties in deployment of mobile broadband networks in rural areas
 - Migration of the current 2G user base to broadband
 - Constraints in adoption of smartphones i.e. affordability, literacy, including digital literacy
 - Fiber
 - Backbone: limited to district/subdistrict
 - Backhaul: 15% tower coverage

Infrastructure Initiatives and Deployment

- ❑ National Telecom Policy, 2012 (Broadband)
- ❑ Fixed Broadband
 - National Optical Fibre Network (NOFN)
 - ❑ BharatNet (Universal Service Obligation Fund (USOF) (shifting timelines, less than 50% fibre infrastructure provided)
 - ❑ Involve only PSUs in fiber roll-out
- ❑ Mobile Broadband
 - Series of spectrum auctions from 2012-2016. No takers for the 700 MHz band. Very high reserve price.

Overall Analysis

- ❑ Need to make more bands of spectrum available: 1800MHz, 5G
 - ❑ Appropriate instruments for spectrum allocation need to be designed. Earlier concerns about reserve price levels.
 - ❑ Enhance spectrum in the unlicensed bands (complementary to Bharatnet), 5G, Vband:
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Way Forward

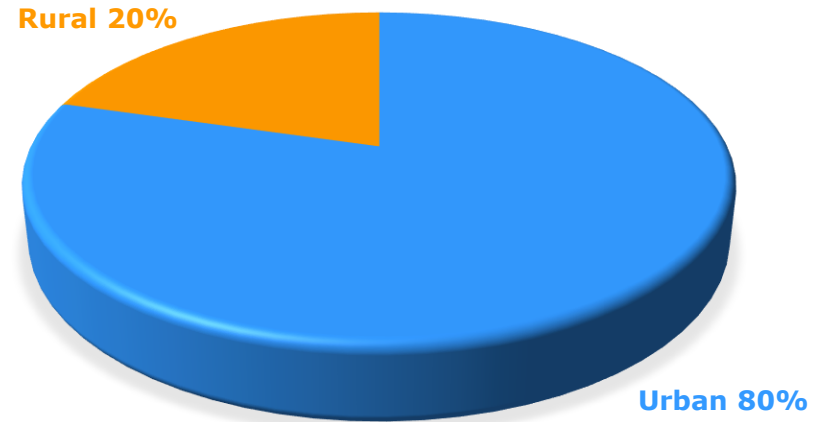
- ❑ Demand Side: Aadhaar, e-government, local language
- ❑ A Spectrum Roadmap covering the next 5-10 years needs to be prepared.
- ❑ Incentivize the development of an affordable, easy-to-use, entry level smartphone in order to increase smartphone usage
- ❑ Financial resources could come partially from the auction proceeds (budget constraints?)
- ❑ Need to review the institutional structure (State governments) and appropriate design of instruments (such as auctions) for accelerating deployment
- ❑ Fixed broadband strategy with an innovative Wi-Fi as the last mile connectivity, should complement the mobile broadband strategy

Mexico – The National Scene

Mexico: Case Study

□ Population: 130,553,684 inhabitants.

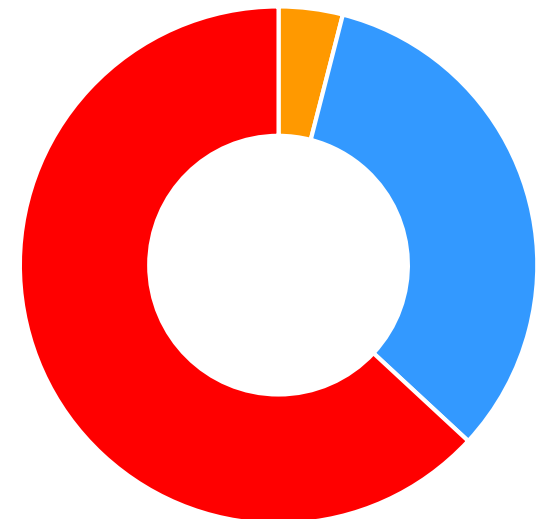
□ Urban-rural population



□ Per Capita GDP (WB, 2016)
1,047 billion USD.

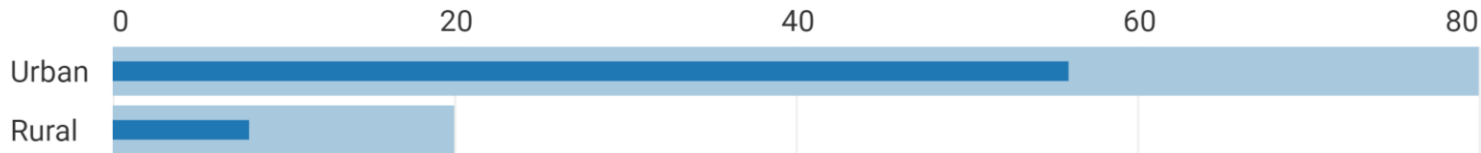


- Agriculture and Allied Sector 4%
- Industry Sector 32.9%
- Service sector 63.1%

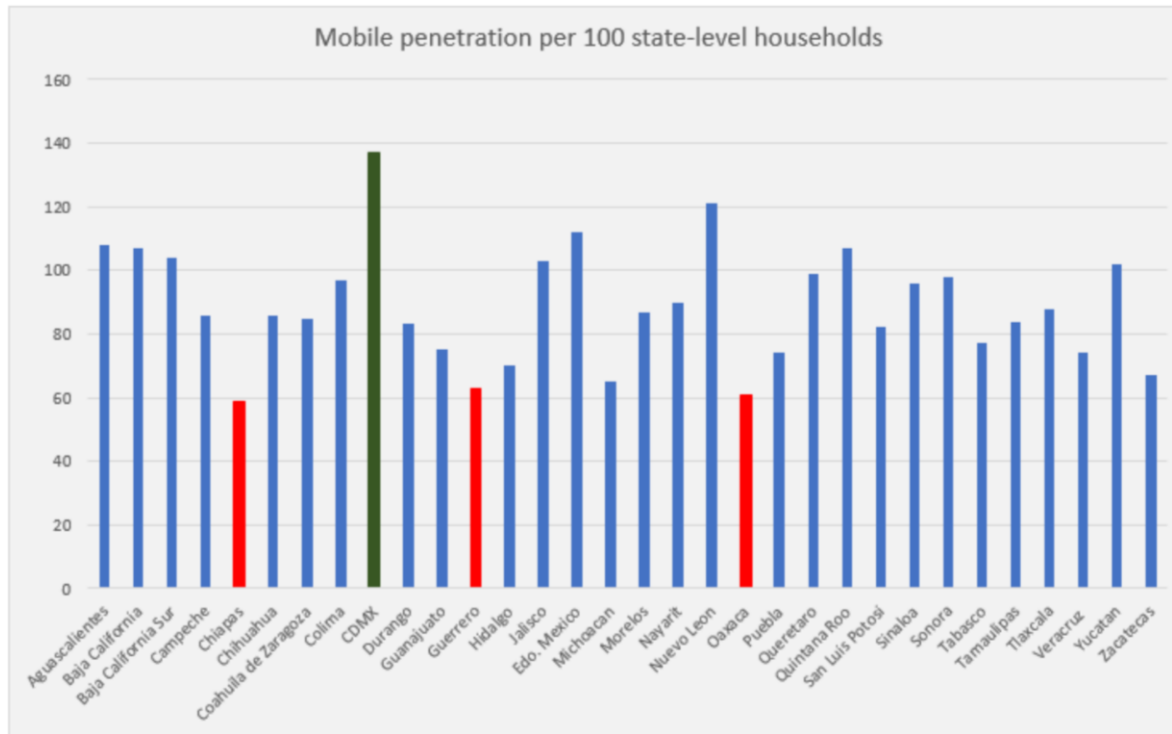


Geographic divide

Internet users by 2017

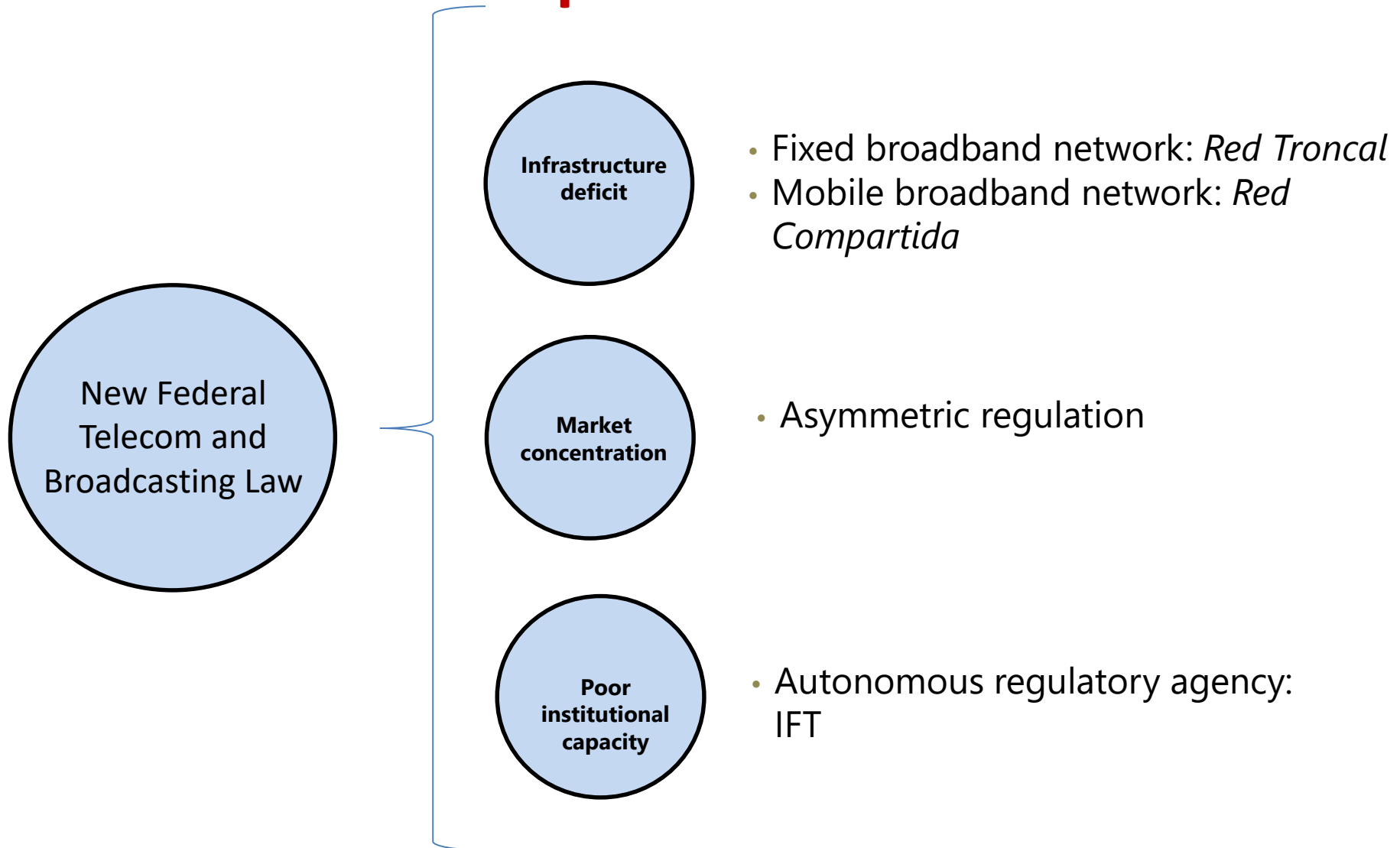


Source: ENDUTIH, 2017



Source: IFT, 2017

Reform responds to long standing problems



Telecommunications market in Mexico

- The Mexican government launched the first generation of reforms in the 1990s and experienced a period of sustained development. Growth was driven by mobile adoption.
- By 2017: 90% mobile penetration while mobile broadband was 65%. Between 2015 and 2016, smartphone users increased by 9.7 points (ENDUTIH, 2016).
- However, today, indicators show Mexico has fallen short of both its own potential for development as well as of comparative performance. It has the lowest mobile penetration of virtually all Latin American countries. Moreover, there is a stark geographic access divide within the country.

Red compartida

- *Red Compartida* is similar to BharatNet in India as a plan to deploy scalable network infrastructure on a non-discriminatory basis.
- Uses the totality of the 700MHz band spectrum from the digital dividend. The coverage goal was modified from 98% to 85% population given the complicated nature of the business model.
- MVNOs are the only possible customers. Existing operators have invested in spectrum different bands and are unlikely to change their business models.
- Altan, the only bidder and thus winner of the bid, will face the challenge of keeping up with the investment of other carriers towards G5.

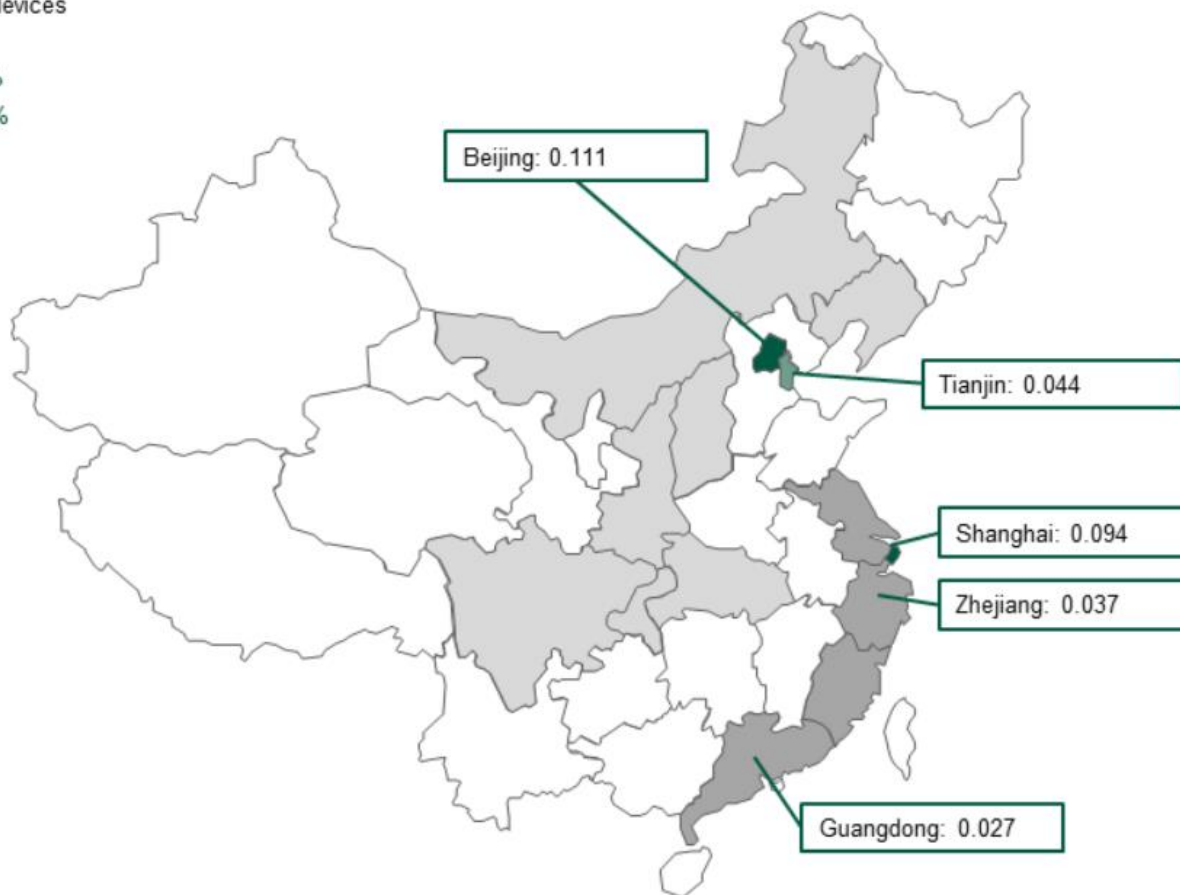
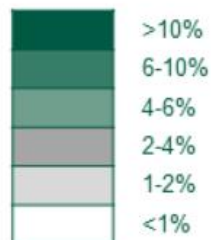
China – The National Scene

China: Telecommunications

- Wireline decline
 - subscriptions expected to fall to 188 million in 2018 (IBIS World, 2018)
 - Wireline industry revenues down 6.3% in 2018 to US\$9.2 billion
- Mobile growth
 - 1.34 billion subscribers, US\$208 billion revenue (2017); compound annual growth of 9.8% over 2012-17
 - But subscription growth is slowing (1.2% in 2017)
 - Average Revenue Per User (ARPU) continues to increase due to value-added 3G and 4G services
 - Revenues grew 5.1%
- challenges remain of aging population, environmental degradation, rapid urbanization (60% now urban) and unbalanced development

Number of iOS devices per person

Total: 21 million devices



Province	Devices p.p.
Beijing	0.111
Shanghai	0.094
Tianjin	0.044
Zhejiang	0.037
Guangdong	0.027
Jiangsu	0.025
Fujian	0.022
Liaoning	0.015
Shaanxi	0.014
Shanxi	0.014
Hubei	0.012
Chongqing	0.011
Inner Mongolia	0.011
Sichuan	0.010
Heilongjiang	0.009
Xinjiang	0.008
Jilin	0.008
Hebei	0.008
Qinghai	0.008
Hainan	0.008
Xizang (Tibet)	0.007
Yunnan	0.007
Hunan	0.007
Guizhou	0.007
Ningxia	0.007
Jiangxi	0.007
Henan	0.007
Guangxi	0.006
Anhui	0.006
Shandong	0.006
Gansu	0.005

Sources: Morgan Stanley AlphaWise, Umeng, Flurry Analytics, insidemobileapps.com, computerworld.com, Apple, Stenvall Skoeld & Company analysis

China: Mobile manufacturing

- Mobile sector as an example of industrial policy. Goals include:
 - Employment generation through mobile manufacturing; use of domestic procurement in aid of manufacturers
 - Moving up the value chain through technology transfer, licensing
 - Capturing technology leadership: standards development, 5G deployment

China: Case study TD-SCDMA

- 1995-98: Xinwei, China Academy of Telecom Technology (CATT), Cwill and Siemens form alliance to develop 3G standard
- 1998: Ministry of Posts and Telecommunications (MPT) submits TD-SCDMA to ITU as official national 3G standard
- 2000: ITU accepts TD-SCDMA as standard
- 2001: Third Generation Partnership Project (3GPP) accepts TD-SCDMA as standard
- 2001-02: No government support, domestic manufacturers reject TD-SCDMA (Huawei for WCDMA, ZTE for CDMA2000)
- 2002: Government allocates 155 MHz unpaired spectrum and 60 MHz paired spectrum for 3G
- 2002: TD-SCDMA Industry Alliance (TDIA) formed
- 2007: Large scale commercialization begins with intent to complete roll-out by 2008 Summer Olympics
- 2008: Telecom restructuring – China Mobile allotted official license to deploy TD-SCDMA
- End of 2012: 192 3G subscribers

China case study: 5G standards

- December 2017: Third Generation Partnership Project (3GPP) announces new 5G standard titled 5G NR (New Radio)
- 2017: China among handful of countries (with United States and South Korea) with active 5G trials
 - China Communications Standards Association (CCSA) is one of the partners in 3GPP process
 - Domestic companies like Huawei and ZTE commercialize the technology
 - Huawei is also partnering with foreign carriers on field tests

Conclusions and Discussion - 1

- Any national strategy has to accommodate local conditions:
 - Reliance on “national champions” in China versus weak public sector players in India with an active private sector
 - Weakness of local manufacturing in India may preclude some strategies
 - Reliance of the Red Compartida only on MVNOs complicates the sustainability of the business model
- Strategies involve trade-offs
 - China’s support for domestic manufacturing came at the cost of local network providers and consumers.
 - Mexico’s Red Compartida missed the opportunity to sublease capacity to other carriers:
 - lack of flexibility for other mobile operators to serve their customers on times of high demand (while providing the network with additional sources of funding in the context of a low number of MVNOs buyers).

Conclusions and Discussion - 2

Critical importance of spectrum availability and efficient allocations

- Example: TD-SCDMA took off only after 3G spectrum allocations.
- No takers for the 700 MHz auction: high reserve price
- Mexico has been the only country in Latin America not to auction the 700 MHz band as the reform mandated the totality of it to be used in the creation of the Red Compartida. And the market needs more spectrum.
- However, the Red Compartida in Mexico offers high quality bandwidth in a low frequency band. If operators face scarcity of low frequency bands and demand for mobile broadband grows, they may become customer
- Larger Issue of design of appropriate institutions and capability
- Need to rethink relative priority of landline and mobile telephony
 - In all three countries, consumers have voted with their feet in terms of landline vs. mobile

Conclusions and Discussion - 3

- Role of shared, scalable network infrastructures may be explored
 - *Red Compartida* in Mexico, Bharatnet in India
 - But critical question, only in rural/underserved areas, or as a national network?
 - To be resolved, questions of competitive neutrality and preferential access

THANK YOU

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