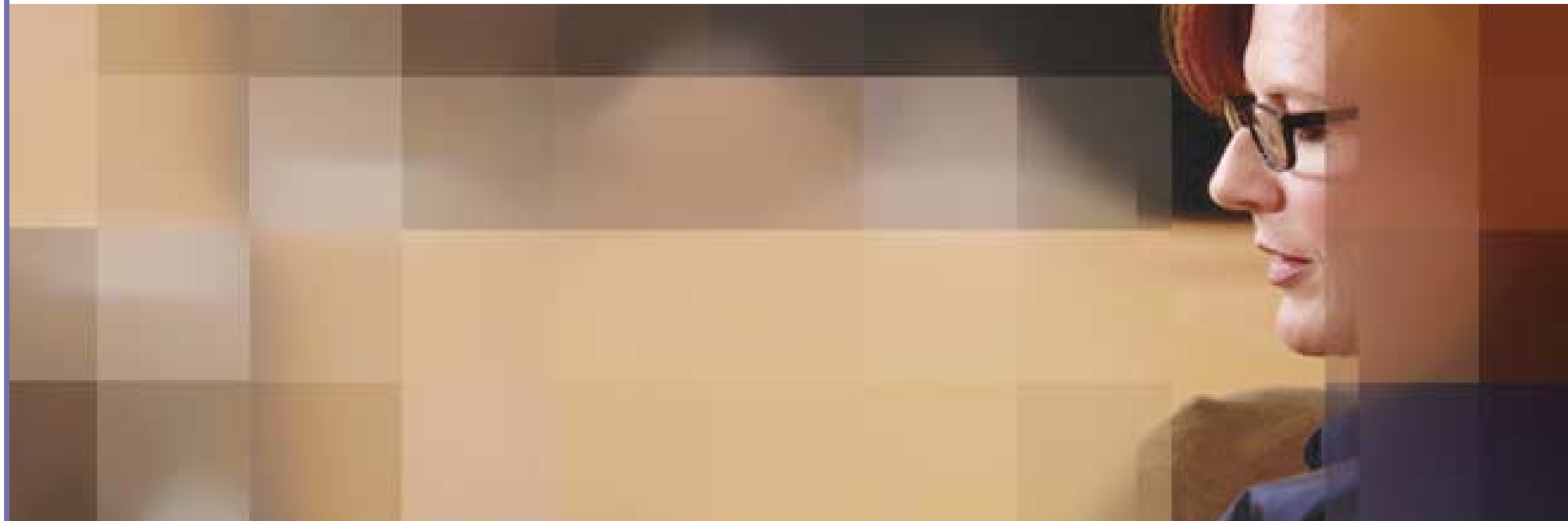

Wireless in emerging markets

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Wireless Technologies

- GSM
- CDMA
- GPRS, CDMA 2000 1x
- WCDMA, CDMA 1x Ev/Do Ev/Dv
- Wi-Fi, Wi-Max
- LMDS/MMDS
- Satellite

Status so far in Developing Countries…

- Mobile growth has been phenomenal – explosive growth in DCs
- In 2002, number of mobile subscribers surpassed that of fixed.
- In most DCs, this happened in less than a decade.
- Cambodia

  Number of mobile subscribers exceeded that of fixed a decade ago.

  Now 90% of all telephone users are mobile.
- India – strong growth with around 2 million subscribers added/month

  Introduction of competing technologies and price decreases
- Russia – growth of 119% to 17.8 million in 2002. By the end of June 2003, further growth of 50% to 25.8. NMT-450 to CDMA-450.

Limitations faced by Developing Countries

- Limited and unreliable existing fixed telecommunications infrastructure

  Mobile networks are cheaper and quicker to rollout and manage. This has been very successful so far.

- Financial barriers

  Prepaid service made mobile services more accessible. Also enabling micro-payments. Mobile phones are cheaper compared to PCs with modems. Mobile phones could act as gateways to the internet…

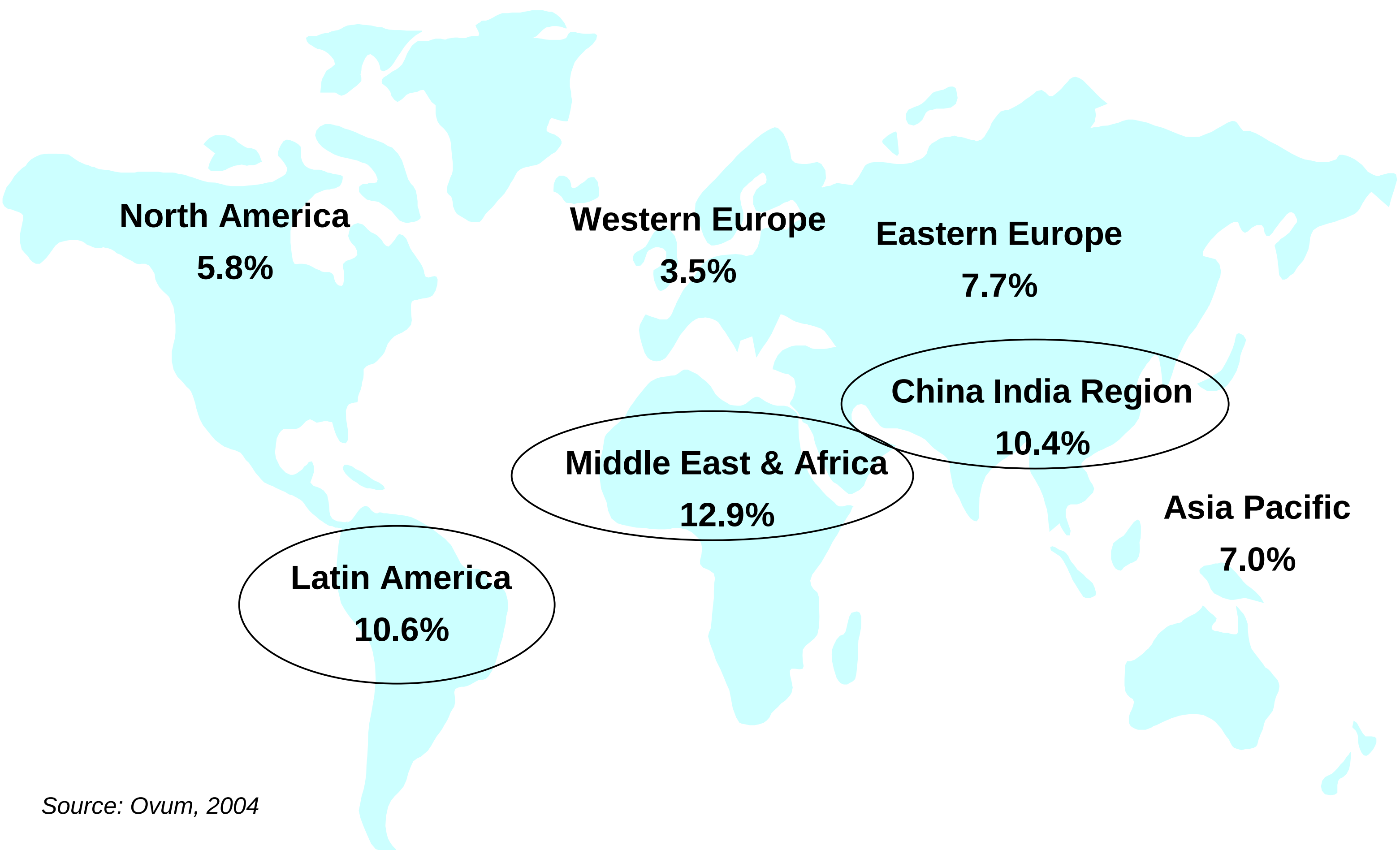
- Socio-economic stability

- Lower level of computer/ICT literacy amongst the population.

  Mobile phones are more user friendly and less complicated to use compared to PCs.

Cellular connections growth

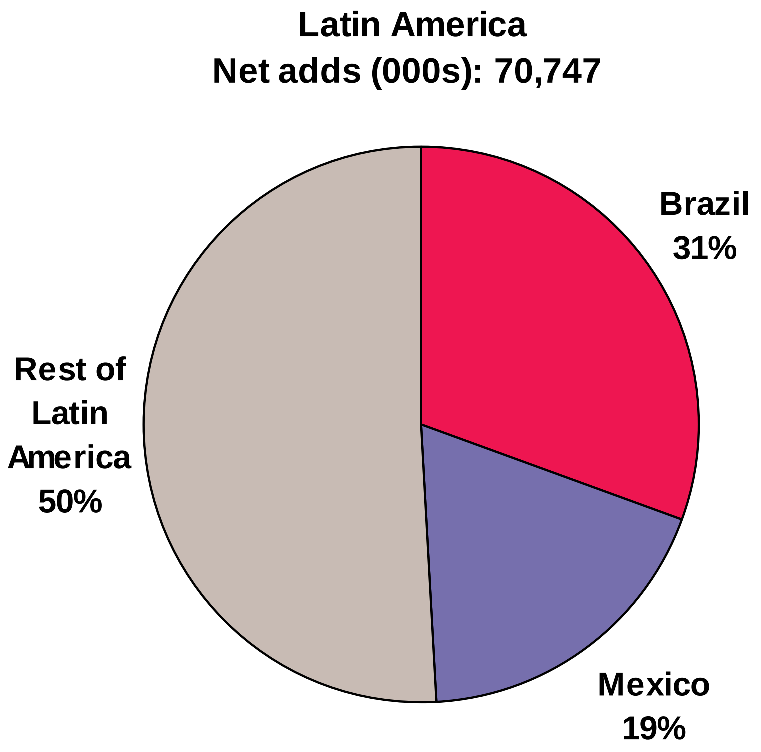
Cellular connections CAGR by region, 2004-08



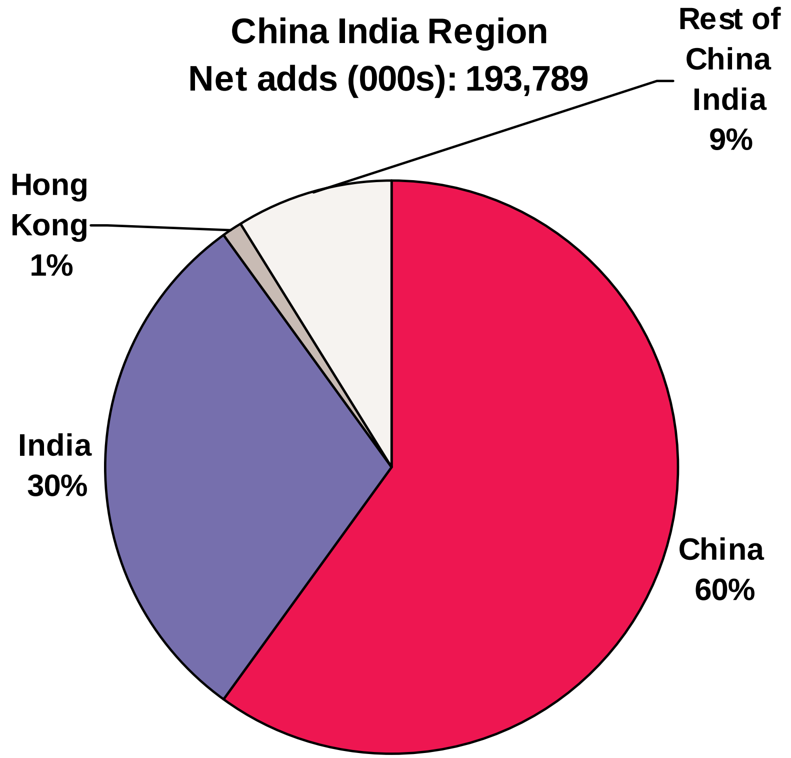
Source: Ovum, 2004

Net additions: key markets

Net additions between 2004 and 2008 by country



Source: Ovum, 2004

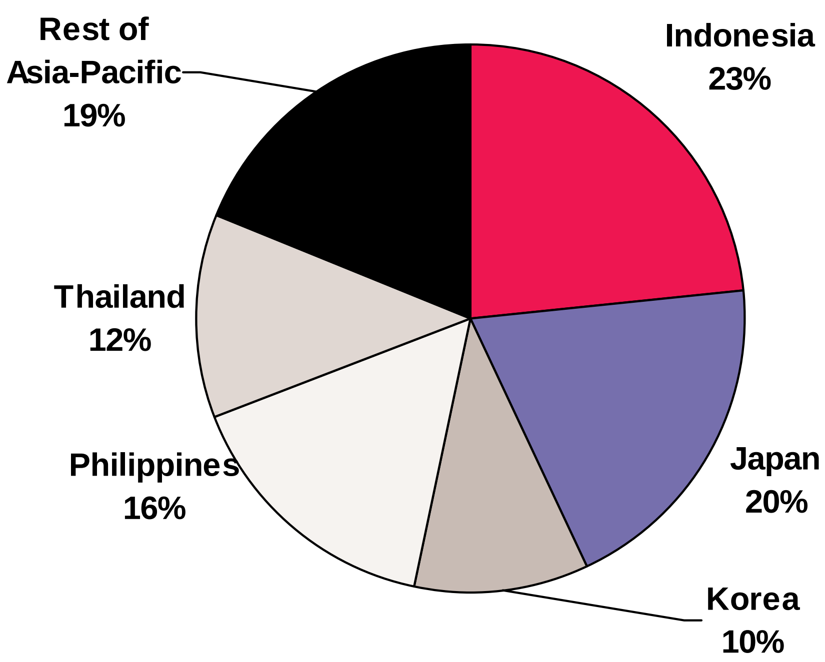


Source: Ovum, 2004

Net additions: key markets

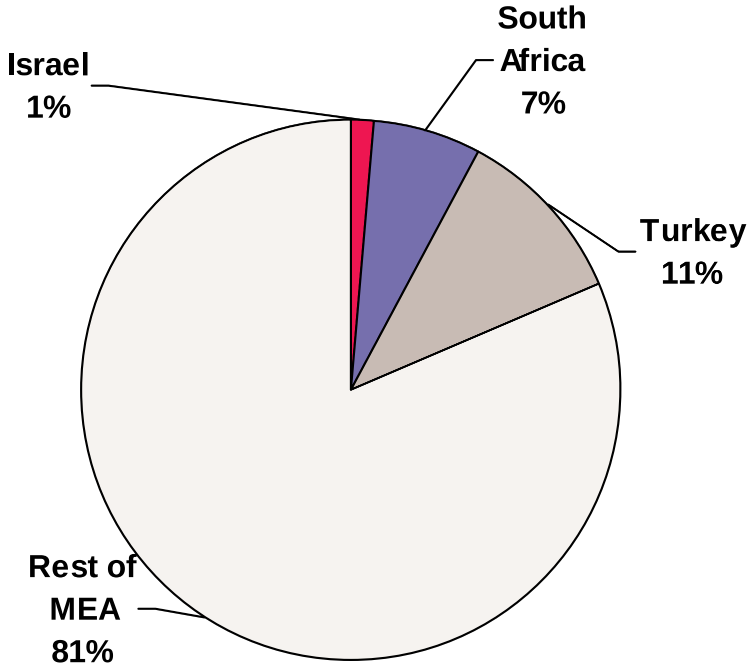
Net additions between 2004 and 2008 by country

Asia Pacific
Net adds (000s): 109,831



Source: Ovum, 2004

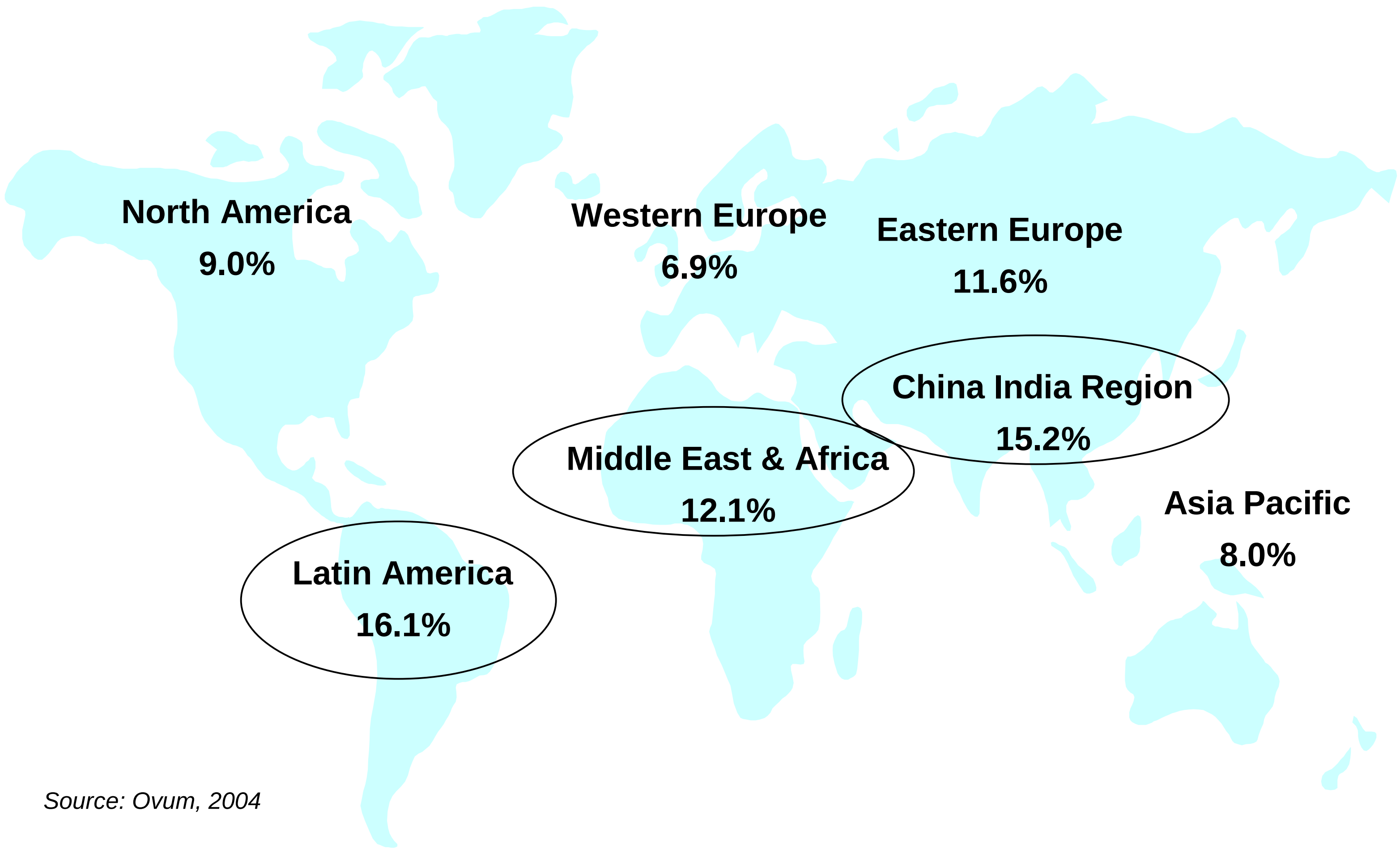
Middle East & Africa
Net adds (000s): 104,143



Source: Ovum, 2004

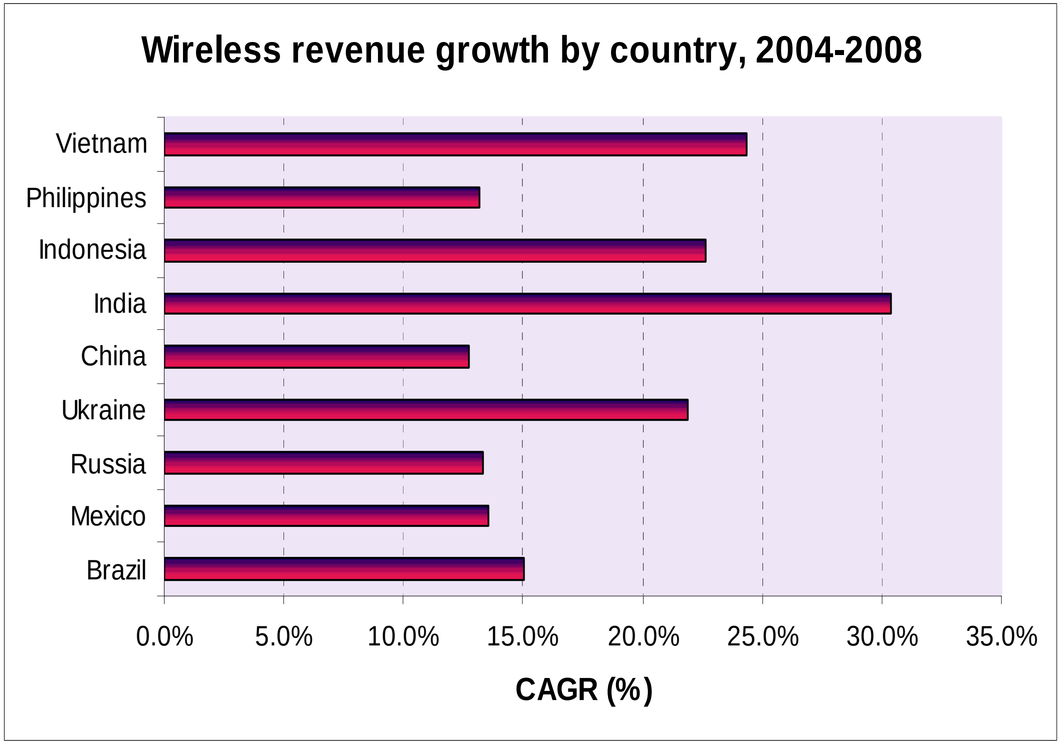
Cellular revenues: most growth in emerging markets

Cellular revenues CAGR (2004-08) by region, in US$



Source: Ovum, 2004

Fastest growing markets by revenues



Source: Ovum, 2004

- Fastest growing markets not only in quantity (connections) but also in quality (revenues)
- India and Asia Pacific markets will experience the fastest growth in revenues

Quantity AND quality

Twin-speed markets

- In urban areas worldwide, usage patterns are similar
  - Users are sophisticated and aware
  - Markets are relatively saturated
  - Handset replacement rates are high
- Growth in rural areas brings its own challenges
  - How to achieve network coverage?
  - How to lower the barriers to entry?
  - How to keep a lid on costs?

We have to think in terms of *regions* not countries

Supply-side issues

- Network rollout is difficult
  - Security issues
  - Terrain is often inhospitable
- How to lower the cost of ownership?
  - Operators have sunk costs
  - Bad debt/security costs are higher
- Vendor relationships
  - More competition on price
  - Favours new-entrant vendors

- Network rollout solutions
  - Re-use infrastructure
  - Reduce site costs, and employ local security
- Managing low-value subscribers
  - ‘Smart’ top-up mechanisms
  - Pooling usage
  - Developing low-end handsets

Demand-side issues

- Fixed line uptake is slowing
  - infrastructure is weak and expensive
  - requires registration and bank accounts in many markets
- Access line substitution is taking place
- Prepaid top-up is both sophisticated and flexible
  - SmartLoad in the Philippines
- There is growth head-room in the cities
  - Users spend more on their mobile phone

On to the discussions…

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