Market Structure and Internet Service Quality

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# Topics & aspects

| Wireline & wireless broadband: are they the same? | • How Internet Service Providers compete?  
• Does wireless compete with wireline or are they independent products? |
|--------------------------------------------------|----------------------------------------------------------------------------------|
| What are the important parameters and how might the definition change over time? | • What is the relationship between the number of competitors & Internet quality?  
• How does this relationship vary with the type of competitor (wireline vs. wireless)? |
| How to define quality? | • Quality as a multidimensional construct |
FCC sponsored field test of **wireline** access network performance (SamKnows)

- **Actual** broadband data rates (March & June 2011)
- **No interference** from home network
- **All regions** & major ISPs
- **Popular** Internet plans only
- **No demographic** information
# Two-step model to study empirical data

**Step 1:** Investigate **market structure** by looking at economic factors that determine market entry

| Dependent variables: # of wireline & wireless providers in CBGs | Economic factors (e.g.): population, income, age, education, area, pop. growth, firm count, regulations |

**Step 2:** Estimate if the number of wireline & wireless Internet service providers affect quality

| Dependent variables (quality): sustained & burst data rate (u/s, d/s), jitter, latency, packet loss | Independent variables: # of wireless and wireless ISP's, economic factors, unobservables |
Results (work-in-progress)

Market structure

Entry patterns are similar for wireline & wireless firms. Entry more likely in markets with *more firms, population (level & growth), younger persons & more densely populated area.*

Wireline ISPs prefer markets with *more educated persons & with less wireless competitors.*

Wireless ISPs prefer markets with *less water area & with less wireline competitors.*
Results; cont’d (work-in-progress)

Broadband quality

Positive correlation between competition (i.e., number of wireline & wireless ISPs) & quality of wireline access.

Marginal effect of competition on quality varies with the number of firms in the market.
Service Quality: back to the roots*

- **Gap Model**\(^2\) (multiple aspects, linear approach)

- **Perceived Quality Model**\(^3\) (multidimensional approach)
  - Technical quality (what is being delivered)
  - Functional quality (how it meets expectations)
  - Image (affects both experience & expectations)

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* Oliver (1980), Lehtinen & Lehtinen (1982), Lewis & Booms (1983)\(^1\), Parasureman *et al.*\(^2\) (1982), and Grönroos\(^3\) (1983)
Extend the one-dimensional, technical methods of measuring quality into a multi-dimensional approach

Use a Quality Tensor to allow for a more complex assessment of service quality and customer experience

Add pricing information

Cross-reference existing performance databases (M-Lab, Ookla, Netflix?)
Market entry patterns are similar for wireline & wireless ISPs

Wireline and wireless are imperfect substitutes

Competition does have an effect on wireline Internet service quality

It is timely to extend existing methods for broadband service quality assessments
THANK YOU!

Questions?

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