

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?

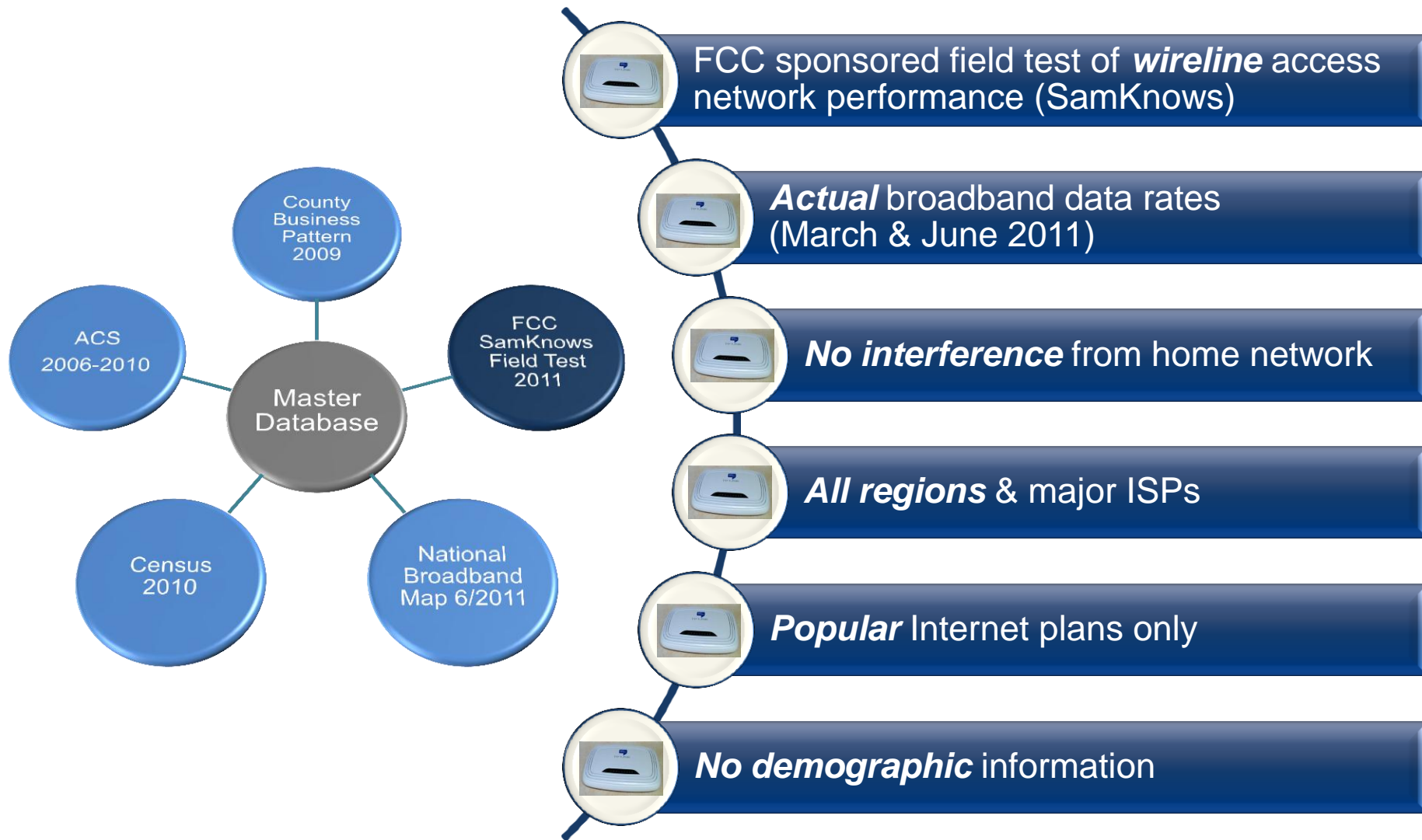
- What is the relationship between the number of competitors & Internet quality?
- How does this relationship vary with the type of competitor (wireline vs. wireless)?

How to define quality?

- Quality as a multidimensional construct



Master Database

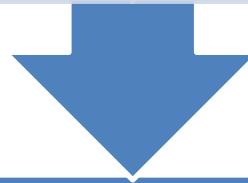


Two-step model to study empirical data

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*



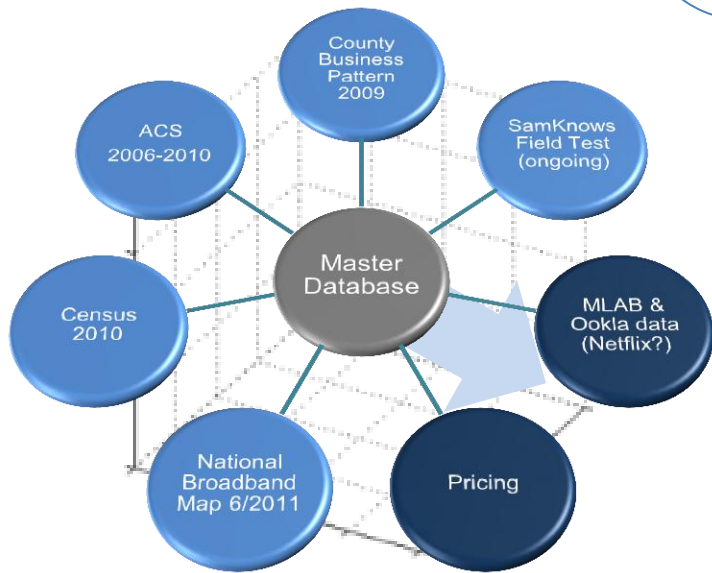
Quality is a measure of how well the service level matches customer expectations¹

- **Gap Model²** (multiple aspects, linear approach)
- **Perceived Quality Model³** (multidimensional approach)
 - Technical quality (what is being delivered)
 - Functional quality (how it meets expectations)
 - Image (affects both experience & expectations)

* Oliver (1980), Lehtinen & Lehtinen (1982), Lewis & Booms (1983)¹, Parasureman *et al.*² (1982), and Grönroos³ (1983)



Future Works



Extend the one-dimensional, technical methods of measuring quality into a multi-dimensional approach

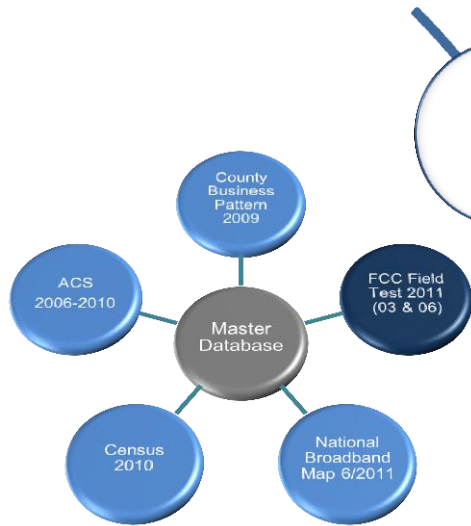
Use a Quality Tensor to allow for a more complex assessment of service quality and customer experience

Add pricing information

Cross-reference existing performance databases (M-Lab, Ookla, Netflix?)



Summary



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

Empirical Study;
preliminary results



An aerial photograph of the University of Colorado Boulder campus. The central focus is a large, multi-story brick building with a prominent central tower and a flagpole flying the American flag. The building is surrounded by lush green trees. In the background, there are rolling green hills and a large, rugged mountain range under a blue sky with scattered clouds.

THANK YOU!

Questions?



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