What is Associated with Providing Fixed Internet Service? A Look at Merged Administrative and Survey Data

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BACKGROUND

- A key aspect of the digital divide is availability, or types of internet service that Internet Service Providers (ISPs) offer to an area
  - Best captured through administrative data collected from ISPs
- Faster and more reliable service through fixed high-speed technologies of cable, DSL, or fiber-optic service

RESEARCH QUESTIONS

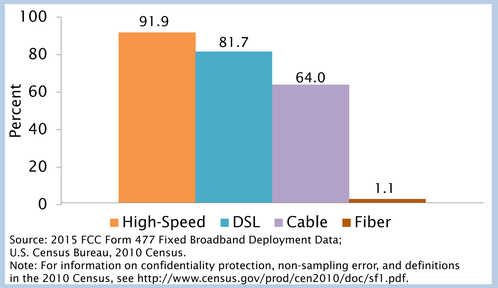
1. How is fixed internet availability distributed across counties?
2. What demographic, economic, and geographic correlates are associated with ISPs providing fixed service to a county?

DATA AND ANALYSIS

- Data sources
  - December 2015 v2 Federal Communications Commission (FCC) Form 477 Fixed Broadband Deployment Data (availability)
  - 2010 Census Summary File 1 (population counts, most recent public-use block-level data)
  - 2011-2015 American Community Survey (ACS) 5-year estimates (correlates)
- Internet technologies
  - Any high-speed broadband service (DSL, cable, or fiber-optic service)
  - DSL service
  - Cable service
  - Fiber-optic service
- Descriptive statistics and county map
- Tobit regression predicting counties' percent of population with service, for each technology
  - Regressions predicting any high-speed service by region
  - Weighted by county population

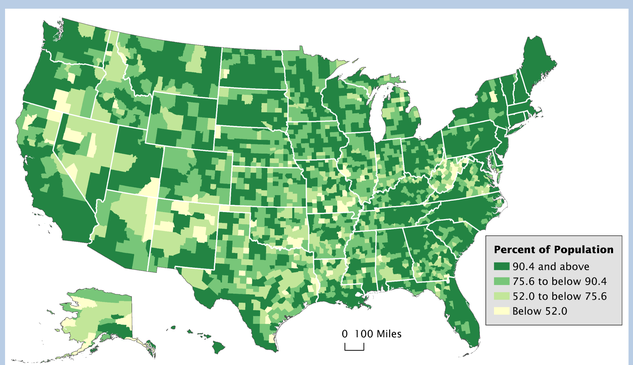
DESCRIPTIVE RESULTS

Median Percent of County Population with Service Available



Source: 2015 FCC Form 477 Fixed Broadband Deployment Data;
U.S. Census Bureau, 2010 Census.
Note: For information on confidentiality protection, non-sampling error, and definitions in the 2010 Census, see http://www.census.gov/prod/cen2010/doc/sf1.pdf.

Percent of County Population with High-Speed Service Available



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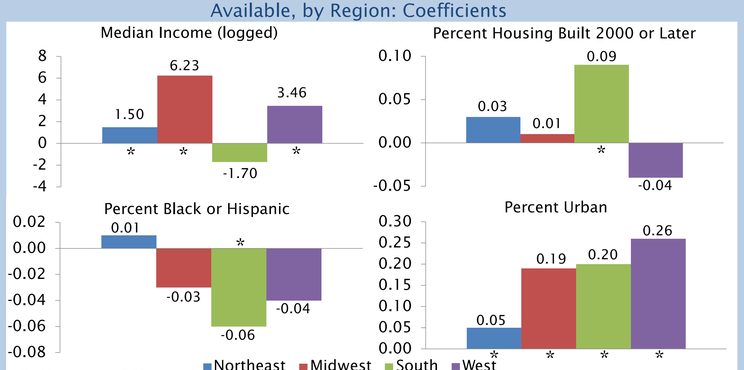
REGRESSION RESULTS

Regressions Predicting Percent of County Population with Each Service Available

	High-Speed		DSL		Cable		Fiber-Optic	
	β	*SE*	*β*	*SE*	*β*	*SE*	*β*	*SE*
Median income *(logged)*	1.62 *	0.56	-3.98 *	1.08	0.36	1.08	33.23 *	2.68
Percent renters	0.05 *	0.01	0.23 *	0.03	0.01	0.03	0.27 *	0.07
Percent housing units built in 2000 or later	0.03	0.02	0.15 *	0.03	-0.04	0.03	-0.23 *	0.07
Region *(reference category is Northeast)*								
Midwest	-2.34 *	0.35	0.93	0.67	-5.99 *	0.67	-31.70 *	1.65
South	-1.68 *	0.38	-2.45 *	0.73	-3.88 *	0.73	-21.48 *	1.79
West	-3.95 *	0.35	-1.98 *	0.68	-8.24 *	0.68	-34.13 *	1.66
Percent Black or Hispanic	-0.05 *	0.01	-0.07 *	0.02	-0.14 *	0.02	0.01	0.04
Percent with member(s) under 18 years	0.01	0.03	-0.17 *	0.05	0.08	0.05	0.32 *	0.12
Percent urban	0.18 *	0.01	0.19 *	0.01	0.64 *	0.01	0.16 *	0.03
Intercept	64.93 *	5.87	112.89 *	11.41	39.05 *	11.41	-350.60 *	28.18

* Significant at the α=0.05 level.
Source: 2015 FCC Form 477 Fixed Broadband Deployment Data; U.S. Census Bureau, 2010 Census, 2011-2015 American Community Survey (ACS) 5-year estimates.
Note: For information on confidentiality protection, non-sampling error, and definitions in the 2010 Census, see http://www.census.gov/prod/cen2010/doc/sf1.pdf. For more information on sampling error, non-sampling error, and confidentiality protection in the ACS, see https://www.census.gov/programs-surveys/acs/technical-documentation/code-lists.html.

Regression Predicting Percent of County Population with High-Speed Service Available, by Region: Coefficients



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RESULTS SUMMARY

- For the average county, the vast majority of population has high-speed broadband service available, though remains short of universal availability
  - Availability of DSL highest, with fiber-optic very low
- Some states have high availability throughout, while others vary in availability from one county to next
- Income has positive overall impact, with negative effect for DSL and large positive effect for fiber
  - ISPs may target high-income counties with fiber, which has higher infrastructure costs, thereby moving these areas away from DSL
- Positive effect for counties with greater share renters (except for cable) and more urban counties
  - ISPs can sell more subscriptions to multifamily units, and high-density areas require fewer infrastructure investments
- Relative to the Northeast, other regions have negative effect on service availability (except for DSL in the Midwest), particularly for fiber-optic
- Income has positive effect on high-speed availability in all regions except the South, where share Black or Hispanic more important
- Percent of housing built in 2000 or later positively related to high-speed availability, but only in the South
- Positive effect of percent urban on high-speed availability for all regions, with greatest effect in the West

NEXT STEPS

- Further explore relevance of geography
- Similar analysis for download speed
- Compare availability to subscription, and assess subscription contingent on availability

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