U.S. vs. European Broadband Deployment: What Do the Data Say?

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A Puzzle

- *New York Times* (April 2, 2014)

  "The United States ranks in 14th place behind countries like Sweden, Japan, South Korea, Romania and Macau in fiber connectivity."

- Neelie Kroes (2013)

  "[W]hile digital technology and content has improved, and countries around the world, from the US to Asia, are starting to reap the benefits out of it, Europe is falling behind."

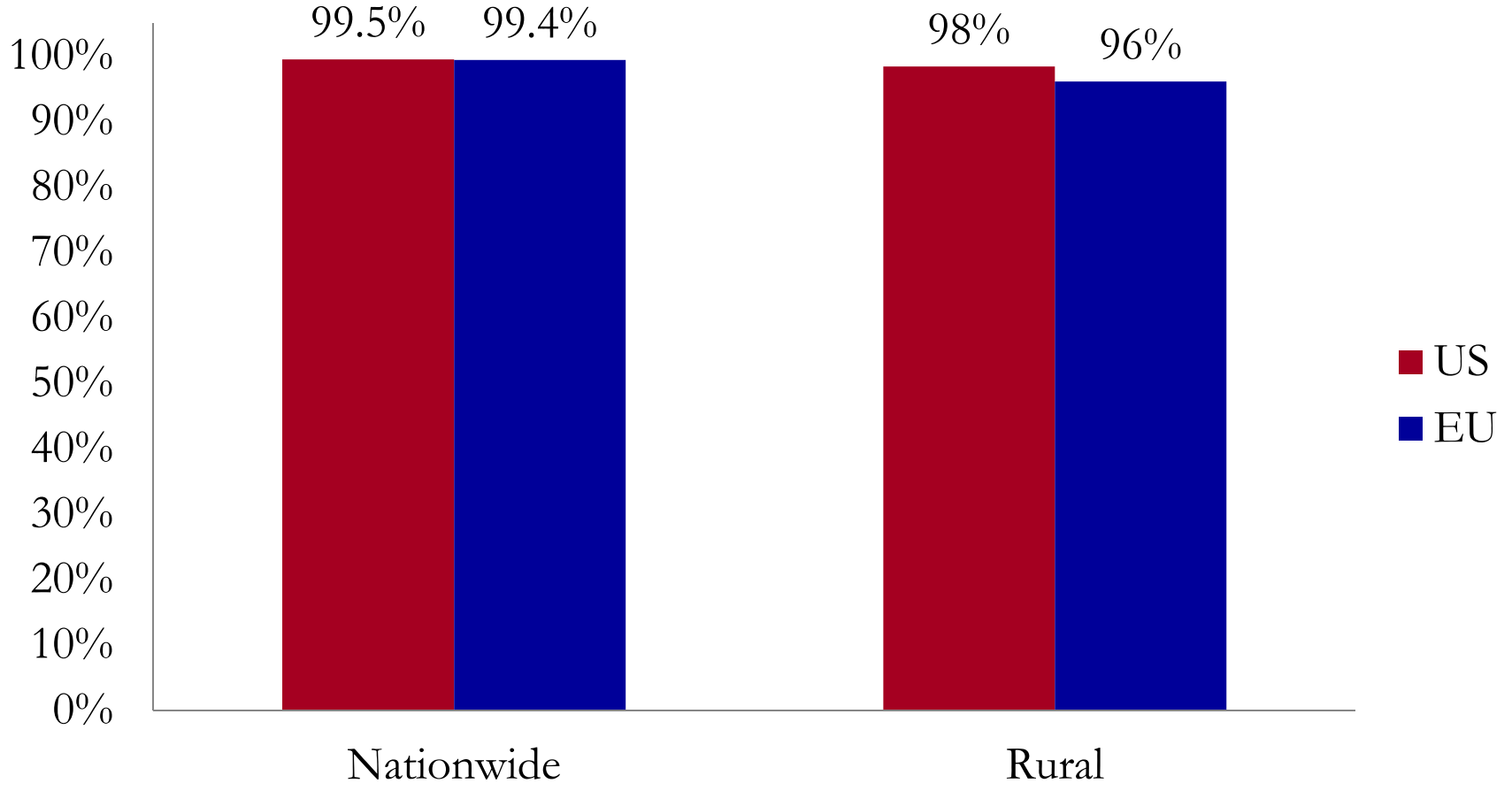
Key Questions

- Conflicting narratives
  - In the U.S.: we are falling behind Europe
  - In Europe: we are falling behind the U.S.
- Conflicting approaches to regulation
  - Europe: promote infrastructure sharing
  - U.S.: promote competition among separate facilities
- Policy choices
  - U.S.: should public utility regulation apply to broadband?
  - Europe: should policy shift to promoting investment?

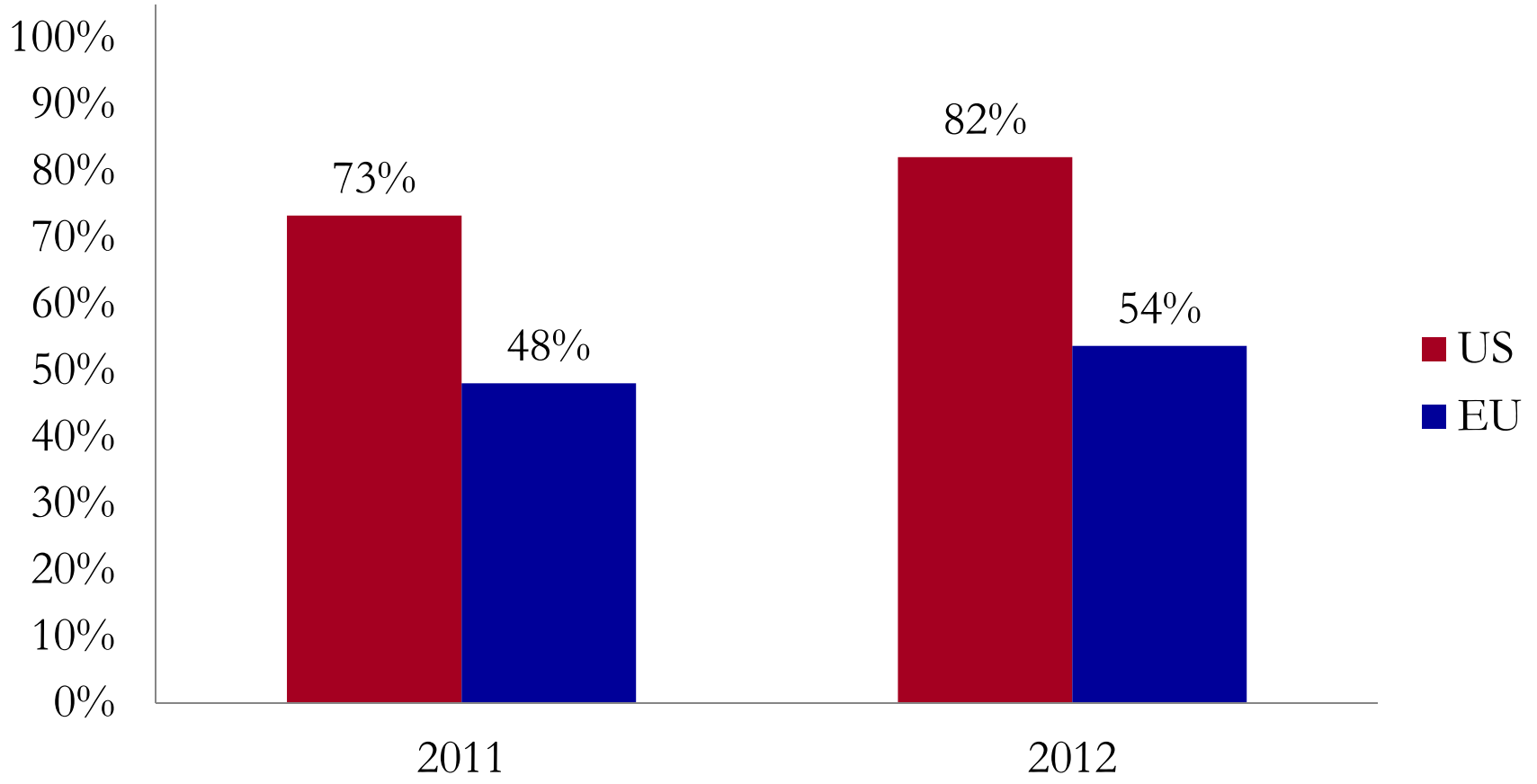
Data Sources

- Previous studies focused on subscription levels, not coverage
- New government data examines coverage
  - EC and U.S. mapping studies
  - EC and U.S. data on adoption, investment, unbundling, speeds, and pricing
  - Demographic data: Eurostat and U.S. Census
  - Commercial data: Akamai, Cisco, Ookla, USTA

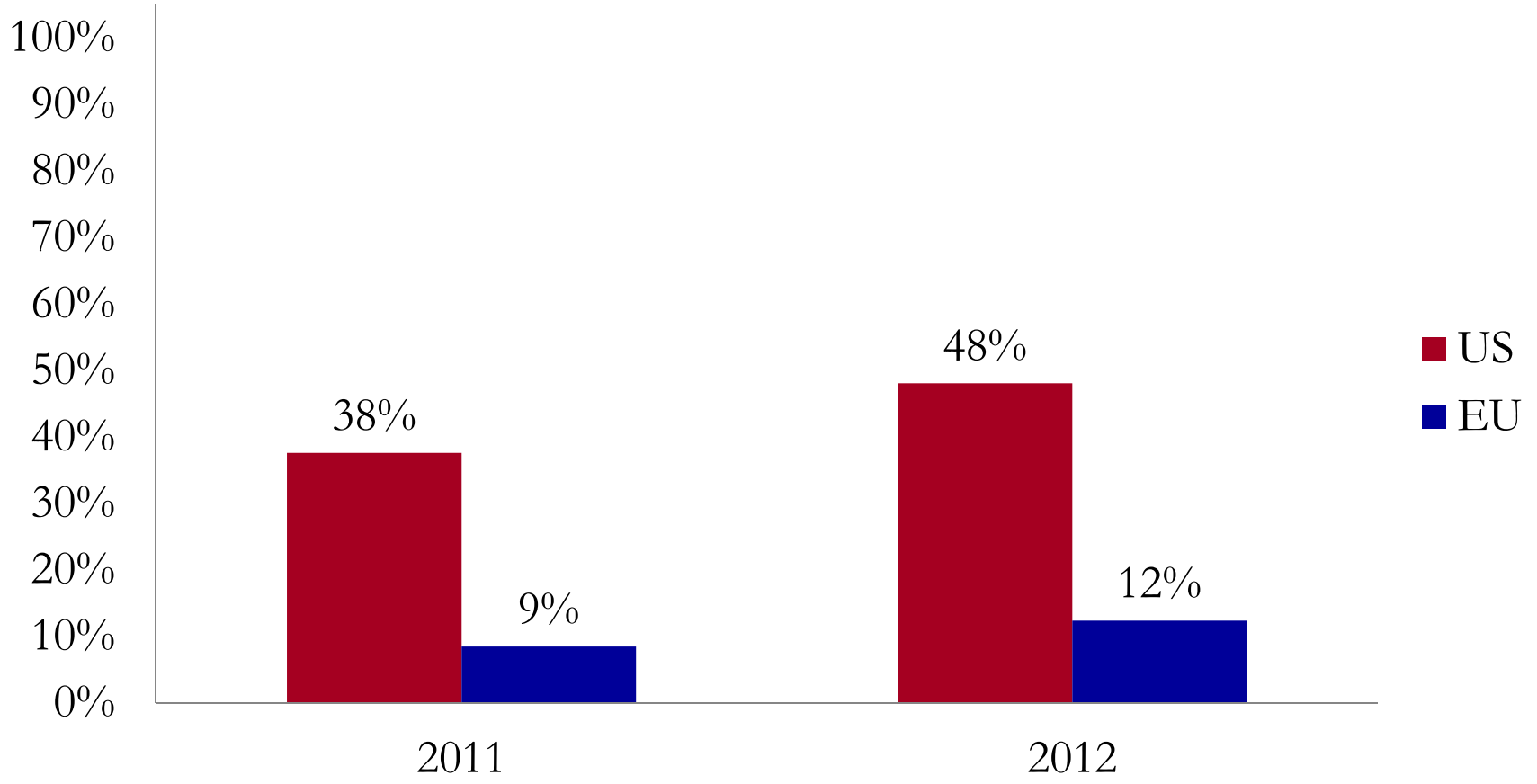
Standard Broadband Coverage (768 kbps U.S./200 kbps Europe)



NGA Coverage (25 Mbps)



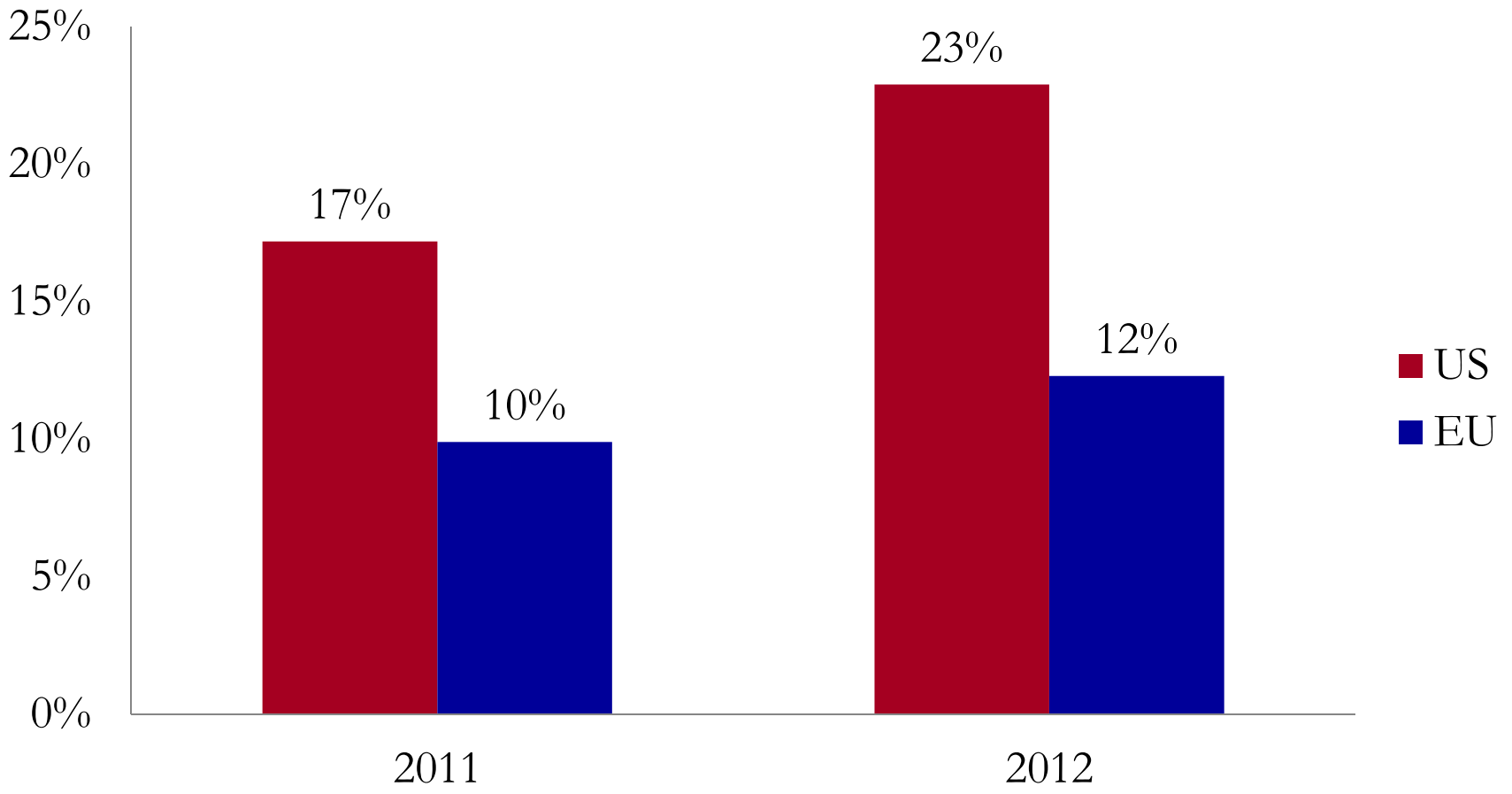
Rural NGA Coverage (25 Mbps)



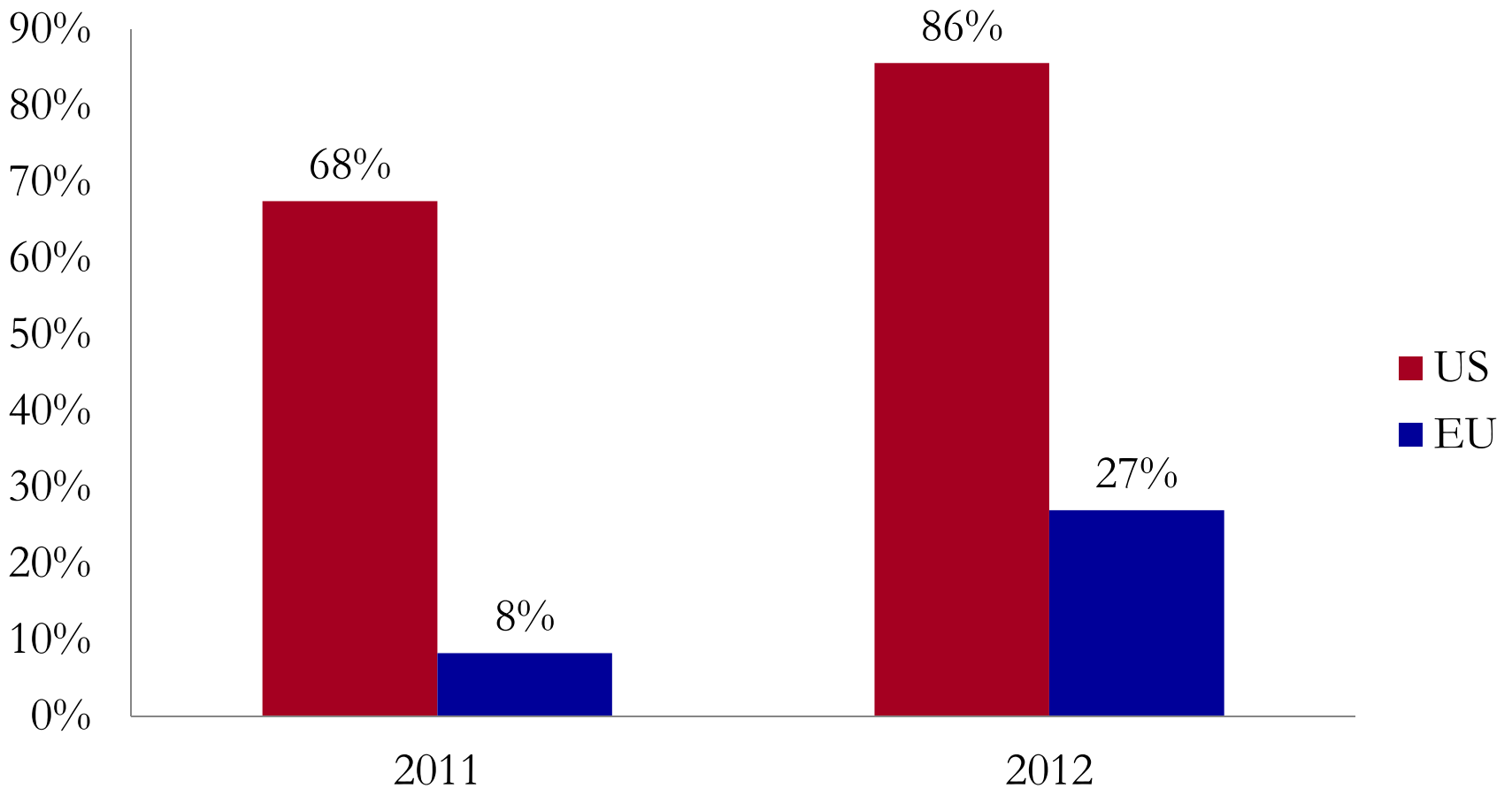
Leading NGA Coverage Countries by Technology Rank, 2012

	NGA	FTTP	DOCSIS 3	VDSL
Malta	1	24	1	3
Netherlands	2	14	2	4
Belgium	3	28	3	2
Luxembourg	4	11	5	1

FTTP Coverage



LTE Coverage



Regression Analysis

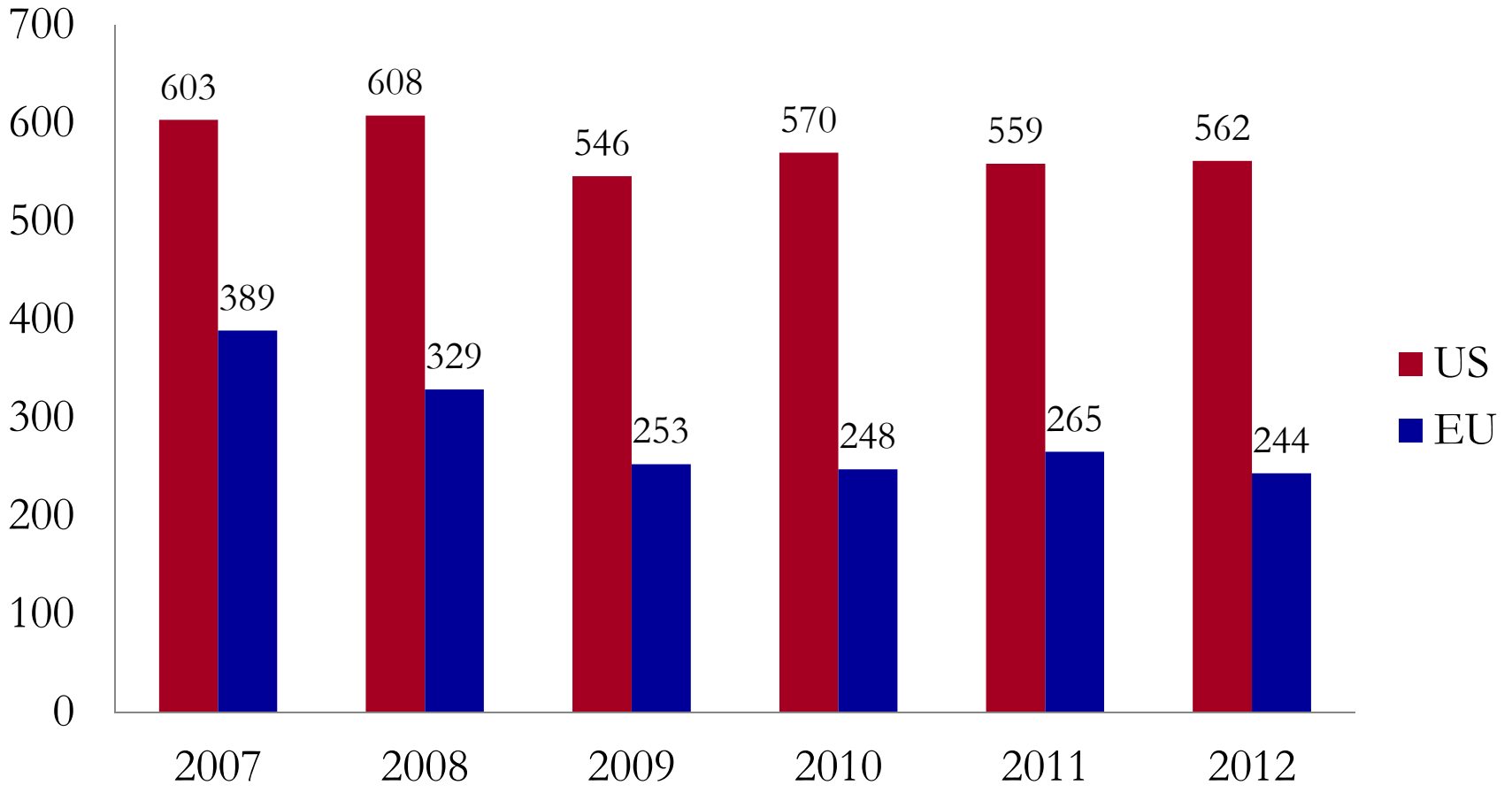
- Dependent variable: 25 Mbps coverage
- Independent variables
  - Pct. DSL lines by new entrants (service-based competition)
  - Cable broadband coverage (facilities-based competition)
- Controls
  - Pct. rural households
  - Per capita GDP
- Key findings
  - Service-based competition reduced 25 Mbps coverage
  - Facilities-based competition increased 25 Mbps coverage

Regression Analysis of Service-Based vs. Facilities-Based Competition

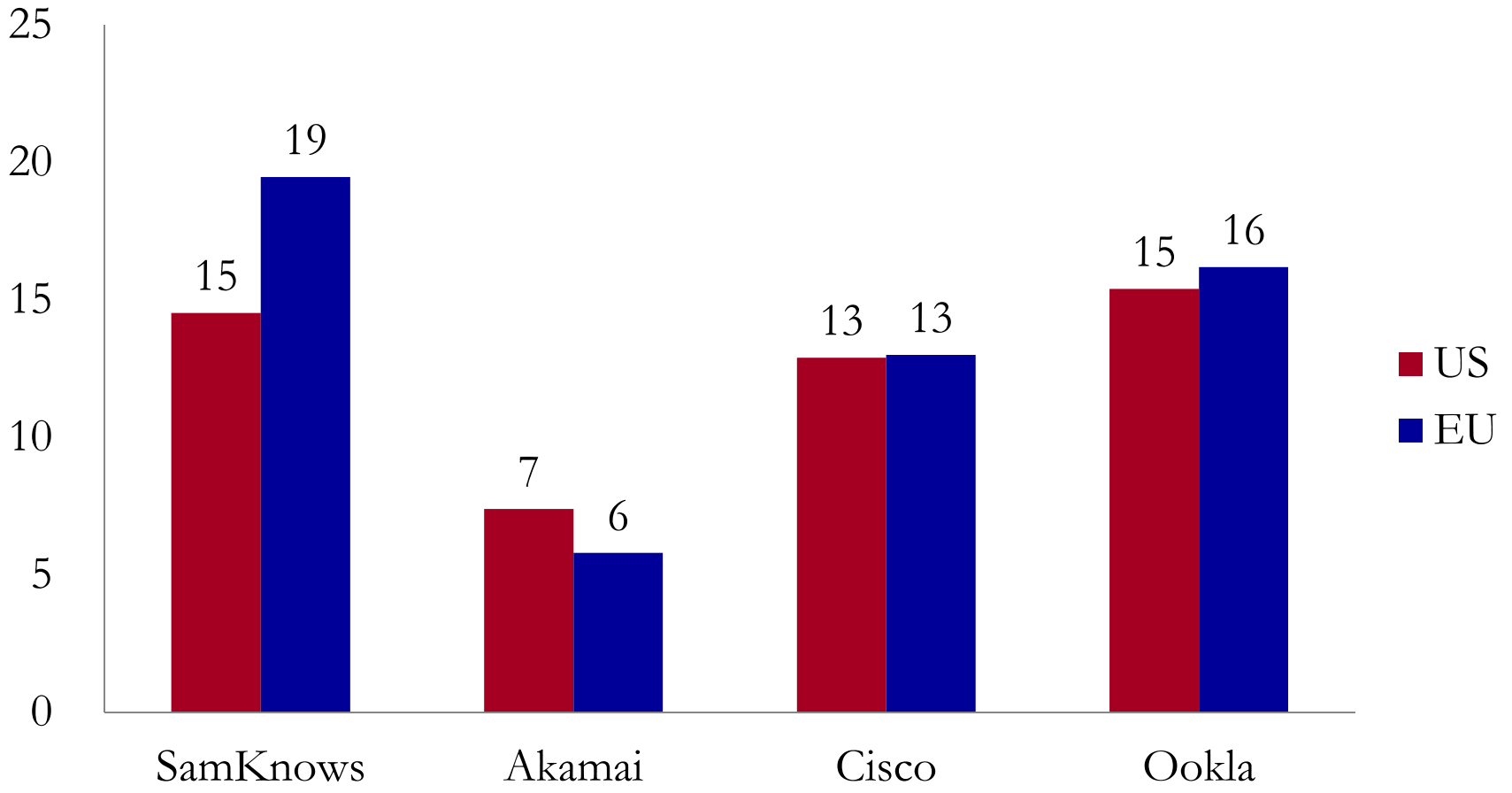
	(1)	(2)	(3)	(4)
Dependent variable	Total NGA coverage	Total NGA coverage	Total NGA coverage	VDSL+FTTP coverage
Pct. DSL by new entrants	–0.809***		–0.244†	–0.770***
Standard cable coverage		0.845***	0.818***	0.288**
Pct. rural households	–1.477*	–0.617***	–0.655*	–1.283**
GDP per capita	0.0028*	0.0014*	–0.0004	0.0019†
Year	0.050***	0.046***	0.036**	0.084***

*** Significant at the 99% level; ** Significant at the 95% level;
* Significant at the 90% level; † Significant at the 80% level.

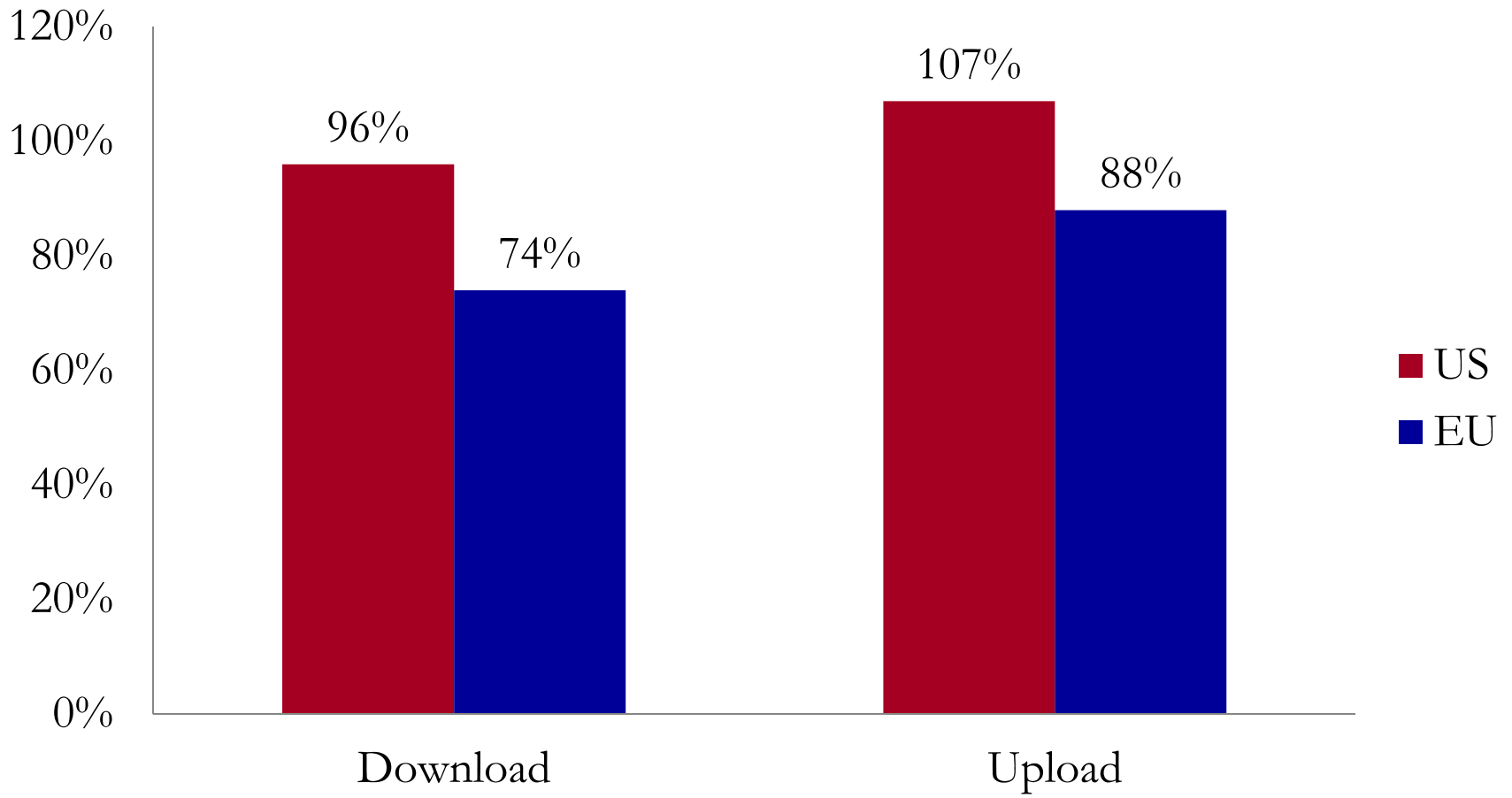
Investment per Household ($)



Average Download Speeds, 2012



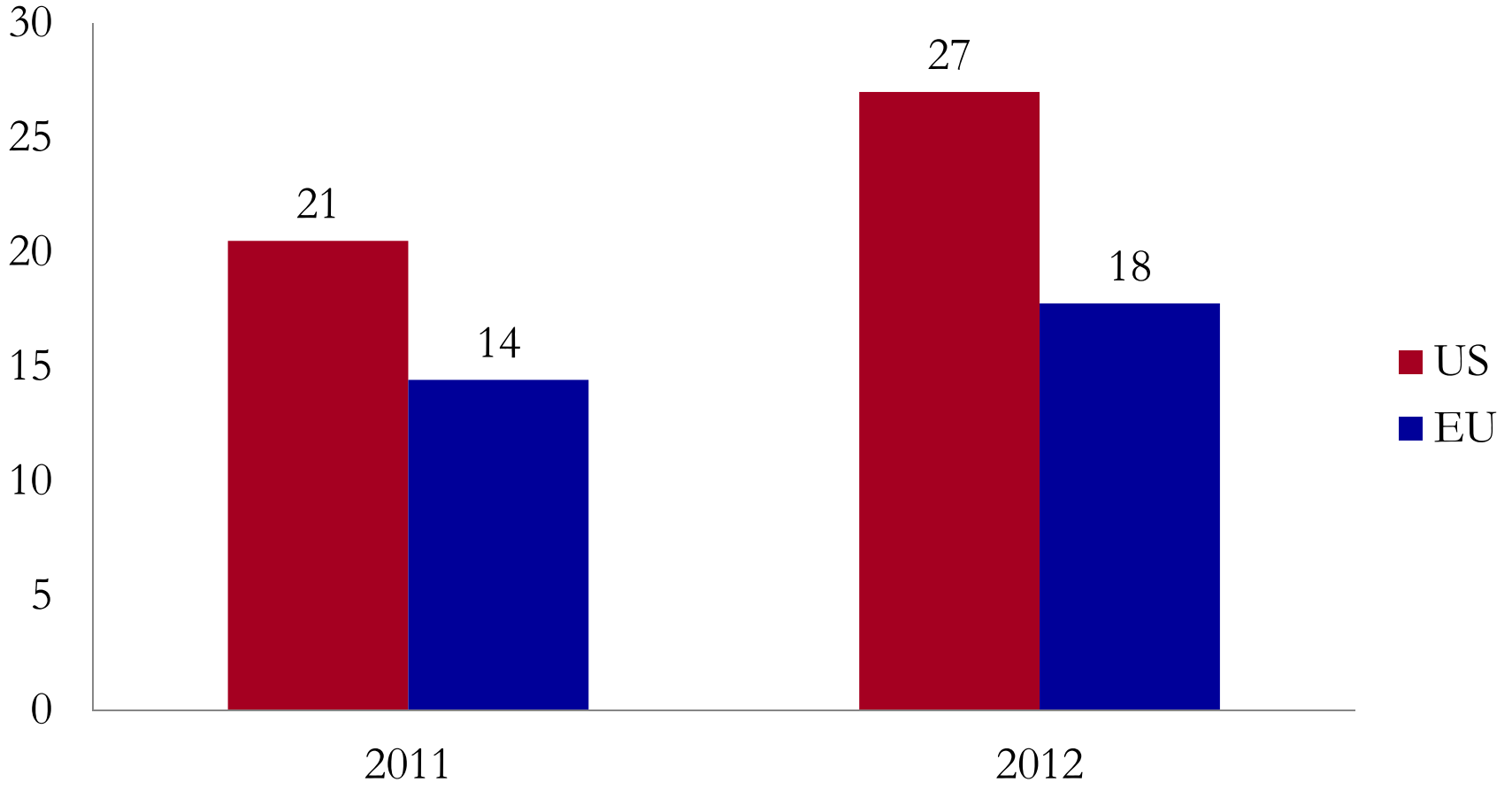
Actual as a Percentage of Advertised Download Speeds, 2012



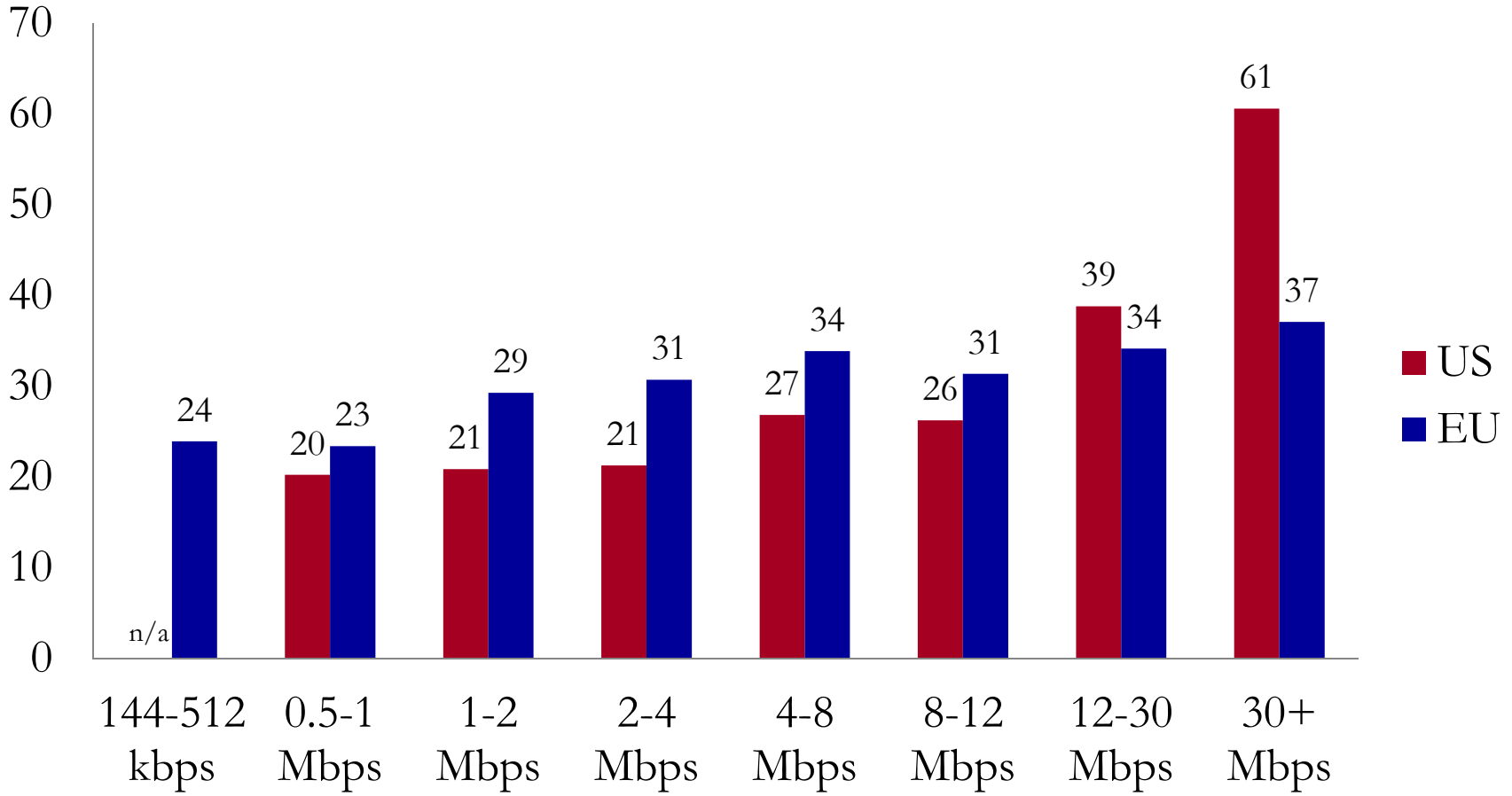
The Distraction of Download Speeds

- Other measures of quality matter (such as latency, reliability, and jitter)
- Throughput is arguably more important
- Broadband is not an end unto itself; best measure is social benefits, such as contribution to GDP

Monthly IP Traffic per User (GB), 2012



Pricing of Standalone Broadband by Speed Tier (Euros), 2012



Country Studies

- Case studies of five largest EU countries (Germany, UK, France, Italy, Spain) and three others (Sweden, Denmark, Netherlands)
- Two countries often lauded for emphasizing fiber (France and Sweden) are 25th and 20th of 28 EU countries
- Countries with best projected NGA coverage have strong cable competition and are emphasizing VDSL (Netherlands, UK, and Germany)

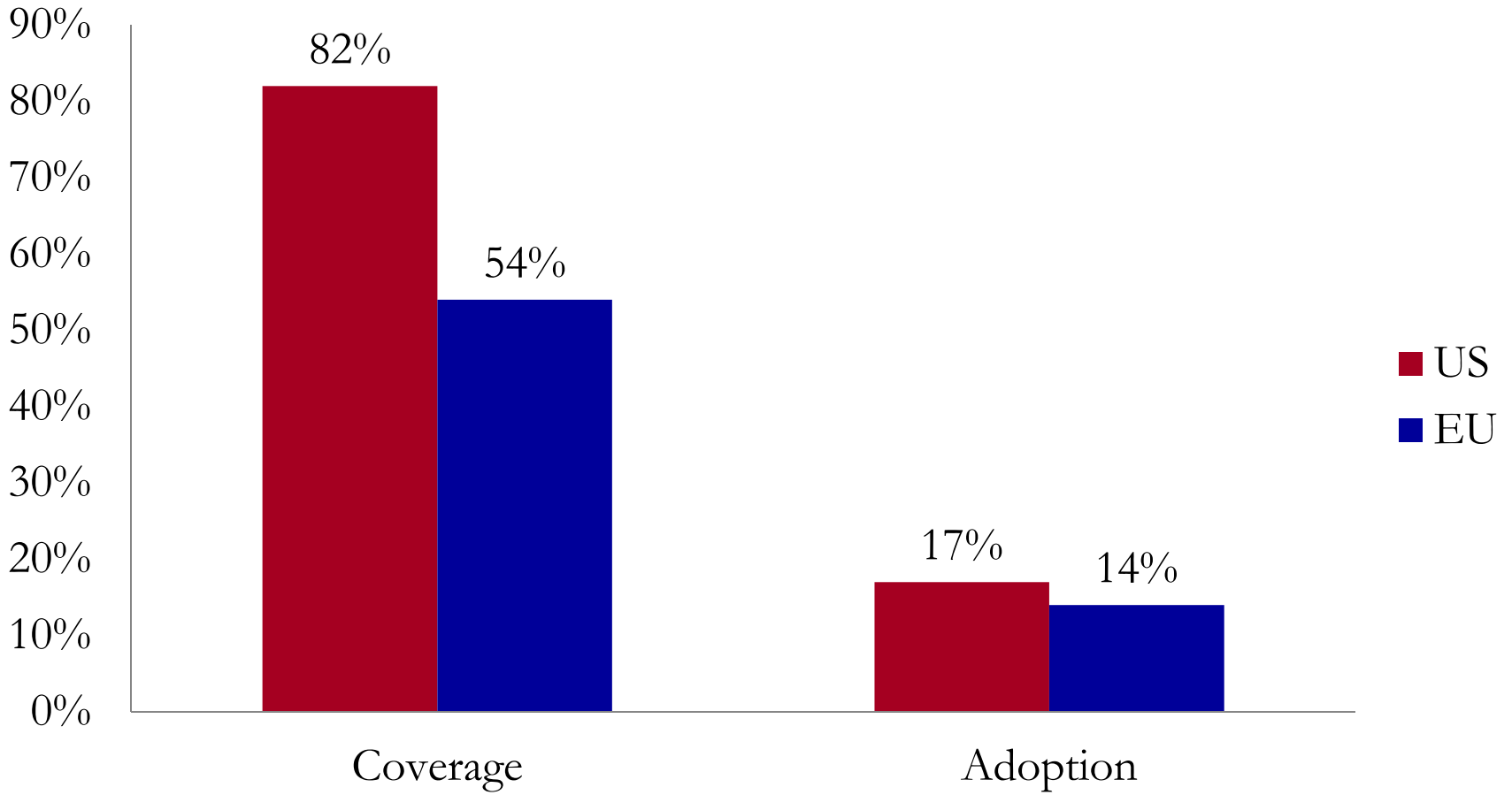
Countries with Higher NGA Coverage Than the U.S., 2012

	Total NGA Rank	Rural NGA Rank	Pct. Rural HHs	EU Rank	Pop. Density (pop/km^2)	EU Rank	Size (sq. km)	EU Rank
Malta	1	1	1%	1	1,327	1	316	1
Netherlands	2	3	8%	2	497	2	41,526	6
Belgium	3	4	5%	3	367	3	30,510	5
Luxembourg	4	2	13%	9	205	9	2,586	2
U.S.	(5)	(5)	19%	(19)	34	(25)	9.6 million	(29)

The Role of FTTP

- To date, FTTP has not yielded high NGA coverage and particularly poor rural NGA coverage
- Forecasts for future FTTP growth are limited
  - "Is it better to provide 75–100 Mbps to 80–90 percent of the population or 1 Gbps to 10–20 percent of the population? Especially when that 10–20 percent is already enjoying faster speeds than the rest."

The Lingering Problem of NGA Adoption (25 Mbps)



The Need Shift Focus to Adoption

- Regulators tend to focus on the supply-side
- Pew: price or availability are not the primary barriers
- FCC: 2/3 of nonadopters will not adopt at any price

Summary of reasons	
Relevance (not interested + waste of time + too busy + don't need/want)	34%
Usability (difficult/frustrating + too old + don't know how + physically unable + worried about virus/spam/hackers/etc.	32
Price (too expensive + don't have computer)	19
Lack of availability / Access	7

Why Do People Think the U.S. Is Behind Europe?

- OECD data focuses on 256 kbps service
- OECD data focuses on subscriptions, not coverage
  - Primary barriers to adoption are not price or availability
  - Solution is not more investment or cheaper service
- Some studies compare dissimilar metrics
  - Compare large cities to nationwide benchmarks
  - Focus on bundles that include video

Conclusions

- Mapping studies contradict the conventional wisdom that U.S. broadband is unavailable, expensive, and slow
- The data indicate that infrastructure sharing lowers investment
- Policymakers should focus on the demand side as well as the supply side