Race and Broadband Adoption: A Decomposition Analysis

Dr. George S. Ford, Phoenix Center

Session:

Understanding Societal and Digital Divides: Race-related Factors, Misinformation, and Hate Speech

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Motivation

- U.S. Public Policy aims to promote broadband adoption.
- There are several 'Digital Divides' targeted.
- Adoption differences among racial groups is one such Divide.
- Closing that Divide requires knowledge about the source of adoption differences.

Empirical Question

- Some minority groups in the U.S. have lower broadband adoption rates than do Whites.

- It is also true that some minority groups have fewer economic resources that affect broadband deployment.

- Do these differences in resources fully explain the difference in adoption, or does race itself, or things correlated with race, matter?

Empirical Question: Descriptive Stats

	Whites	Hispanics	Blacks	Native Amer.
Broadband Adoption	0.876	0.817	0.832	0.754
Family Income ('000)	85.59	62.54	60.16	59.34
College Degree	0.237	0.124	0.153	0.111
Internet at Work	0.552	0.445	0.453	0.428

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Decomposition

$$\Delta = E(Y_A) - E(Y_B)$$

Means differences between Groups A and B for outcome *Y*.

$$Y_k = X_k'\beta_k + \varepsilon_k$$

Outcome *Y* for group *k* is a linear function of resources *X*.

$$\Delta = E(X_A)'\beta_A - E(X_B)'\beta_B$$

Means differences between Groups A and B for outcome *Y*.
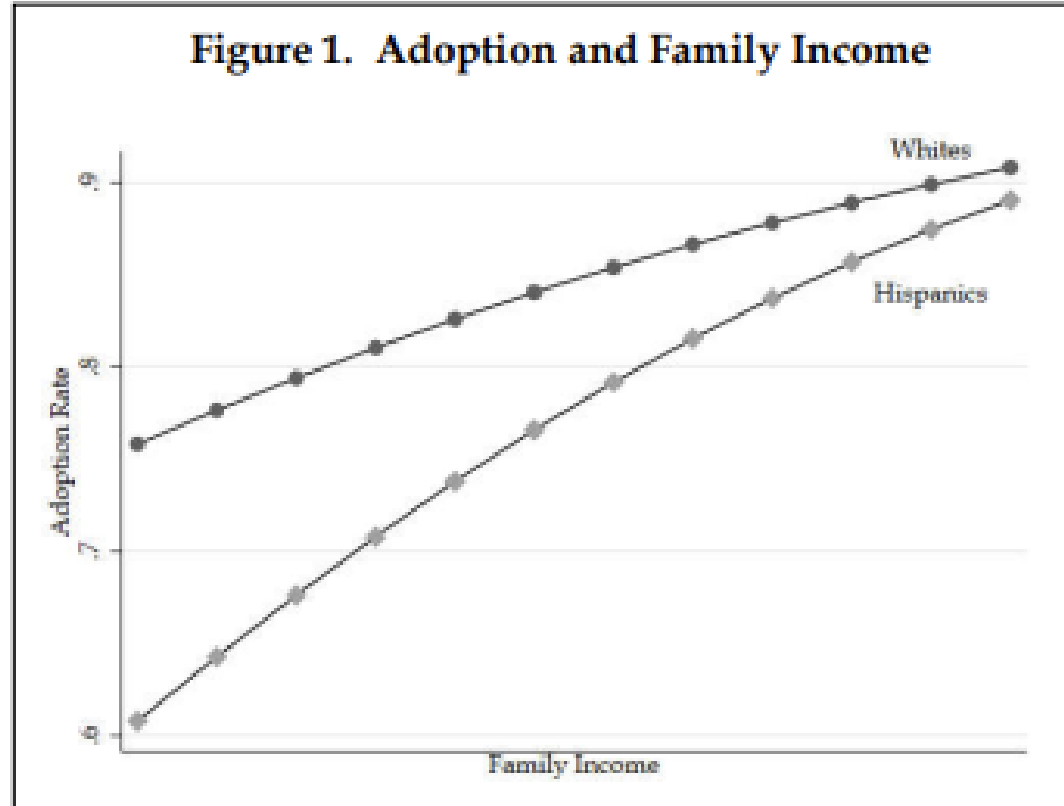
Decomposition

$$\Delta = E(X_A - X_B)'\beta* + E(X_A)'(\beta_A - \beta*) - E(X_B)'(\beta_B - \beta*)$$

Difference explained by differences in *X* (differences in *X*, same response).

Difference unexplained by *X* (differences in response to *X* and the constant term).

$\beta*$ is a reference vector.

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Response to *X*

Figure 1. Adoption and Family Income

Estimation

- Dep. Var. = Household has fixed broadband (0/1) [Logit]
- Covariates
  - Family Income
  - Age
  - Education Levels
  - Metro/Rural
  - Internet at Work or School
- Data
  - Current Population Survey, Internet Supplement, 2017 & 2019.

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Results

Decomposition Results: Whites as Reference Vector			
	Hispanics	Blacks	Native Amer.
White's Mean	0.876	0.876	0.876
Min. Group's Mean	0.817	0.832	0.754
Difference	0.059***	0.044***	0.122***
Explained	0.010***	0.007***	0.045***
Share	16.6%	16.6%	37.2%
Unexplained	0.049***	0.036***	0.076***
Share	83.4%	83.4%	62.8%
* 10%, ** 5%, *** 1%			

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Results: Including Mobile Broadband

Decomposition Results: Pooled as Reference Vector			
	Hispanics	Blacks	Native Amer.
Pooled Mean	0.989	0.990	0.990
Min. Group's Mean	0.990	0.988	0.979
Difference	-0.001	0.001	0.011***
Explained	0.000	0.001***	0.004***
Share	...	...	39.3%
Unexplained	-0.001	0.000	0.007***
Share	...	...	60.7%
* 10%, ** 5%, *** 1%			

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Policy Implications

- Adoption is not merely about resources like income. Subsidies, which target income, may not be as effective as desired.

- Increasing adoption in minority communities may require targeted efforts.

- Adoption, when including mobile broadband, is nearly ubiquitous and equal across racial groups.

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George S. Ford, PhD

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