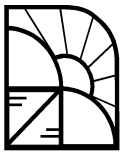

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PHOENIX CENTER POLICY BULLETIN NO. 52

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May 2021

RACE AND BROADBAND ADOPTION: A DECOMPOSITION ANALYSIS

Abstract: As governments push for universal adoption of broadband Internet service, policies must address the fact that many households with access to the service do not to subscribe to it. Lower adoption rates in some minority communities are one cause for concern. A confounding factor with respect to race is that it is often correlated with income, education, and other factors that drive Internet adoption in the home. Do these differences in socio-economic resources fully explain the difference in adoption rates? In this BULLETIN, I decompose the effects of socio-economic factors on broadband adoption distinct from the effects of race. My analysis finds that differences in socio-economic resources like income and education do relatively little to explain the differences in adoption among racial groups. The demand for broadband *appears to be influenced by unobserved factors correlated with race.* It appears, therefore, that addressing the lack of adoption of the Internet at home may require remedial measures targeting specific minority groups rather than uniform policies that address socio-economic resources like income.

I. Background

Universal availability and adoption of broadband Internet service has been a long-standing national policy goal. But while both the Federal government and the states have devoted billions of dollars to the task over the years, universality remains elusive. Many rural areas remain unserved in the face of the high cost of network deployment, despite subsidies to offset

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such costs.[1] Even in areas covered by broadband networks, whether urban or rural, many households simply do not subscribe to broadband services in the home.[2] A lack of sufficient income is one reason for the lack of broadband service—adoption and income are highly correlated—but there are other factors that influence adoption.[3] Internet use in the home is positively correlated with education, for instance.[4] As governments push for widespread adoption, policies may need to address many factors that influence household decisions to subscribe to broadband services.

One important (but politically delicate) dimension to the universality problem is the question of how to expand broadband adoption in minority communities. A confounding factor with respect to race is that race is often correlated with income and education, among other potentially relevant determinants of Internet adoption in the home. Such relationships beg the question of whether race (or, perhaps more accurately, unobserved factors correlated with race) is an independent factor influencing adoption or are racial differences in broadband adoption merely reflective of differences in socio-economic resources. Statistical analysis may shed some light on this interesting and potentially policy-relevant question. Using the method

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1 *See, e.g.,* T.R. Beard, G.S. Ford and M. Stern, *Bridging the Digital Divide: What Has Not Worked But What Just Might*, PHOENIX CENTER POLICY PAPER NO. 56 (June 2020) (available at: https://www.phoenix-center.org/pcpp/PCPP56Final.pdf).

2 *See, e.g.*, B. Levin and L. Downes, *Cities, Not Rural Areas, Are the Real Internet Deserts*, THE WASHINGTON POST (September 13, 2019) (available at: https://www.washingtonpost.com/technology/2019/09/13/cities-not-rural-areas-are-real-internet-deserts).

3 *See, e.g., Internet/Broadband Fact Sheet*, Pew Research Center (April 7, 2021) (available at: https://www.pewresearch.org/internet/fact-sheet/internet-broadband/?menuItem=480dace1-fd73-4f03-ad88-eae66e1f4217); *Falling Through the Net: Toward Digital Inclusion*, National Telecommunications Information Administration ("NTIA") (October 2000) (available at: https://www.ntia.doc.gov/files/ntia/publications/fttn00.pdf); *Exploring the Digital Nation*, National Telecommunications Information Administration ("NTIA") (November 2011) (available at: https://www.ntia.doc.gov/files/ntia/publications/exploring_the_digital_nation_computer_and_internet_use_at_home_11092011.pdf); Y.K. Dwivedi & B. Lal, *Socio-Economic Determinants of Broadband Adoption*, 107 INDUSTRIAL MANAGEMENT & DATA SYSTEMS 654-671 (2007); C.G. Reddick, R. Enriquez, R.J. Harris, and B. Sharma, *Determinants of Broadband Access and Affordability: An Analysis of a Community Survey on the Digital Divide*, 106 CITIES 102904 (1-11) (2020) (available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7480260); G.S. Ford, *Confusing Relevance And Price: Interpreting And Improving Surveys On Internet Non-Adoption*, 45 TELECOMMUNICATIONS POLICY (March 2021) (https://doi.org/10.1016/j.telpol.2020.102084).

4 *Internet/Broadband Fact Sheet, id.*

crafted by Blinder (1973) and Oaxaca (1973), I decompose the effects of observable socio-economic factors on adoption distinct from the effects of race.[5]

Using data on adult respondents from the *Computer and Internet Use Supplements* to the Current Population Survey, I apply the standard decomposition model to separate the explained influence of socio-economic factors and the unexplained influences of race on high-speed Internet adoption in the home. My analysis finds that the differences in broadband adoption among races is only partially explained by differences in socio-economic resources; the means differences among races mostly reflect the unexplained influence of unobserved factors correlated with race. Direct subsidies to users to pay for Internet service may aid in resolving differences in income, but for some minorities income explains little of the differences in adoption. Targeted policies for minority groups may be necessary, though such nuanced policies may present challenges to policymakers.[6]

II. The Decomposition Model

Survey evidence (and statistical analysis based on surveys) consistently shows that broadband adoption rates are determined by a variety of factors.[7] For instance, broadband adoption is positively related to income and education. Such evidence also shows that adoption varies across racial groups. Minority groups, in particular Hispanics, Blacks, and Native Americans, tend to have lower adoption rates.[8] But these same groups also have, on average, lower incomes, less education, and differ from Whites along other dimensions. These relationships beg the question: do the differences in socio-economic resources the differences in

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[5] A.S. Blinder, *Wage Discrimination: Reduced Form and Structural Estimates,* 8 JOURNAL OF HUMAN RESOURCES 436–455 (1973); R. Oaxaca, *Male-Female Wage Differentials in Urban Labor Markets,* 14 INTERNATIONAL ECONOMIC REVIEW 693–709 (1973).

[6] The NTIA has a *Minority Broadband Initiative* to investigate the challenges of broadband adoption "in vulnerable communities." See background at: https://www.ntia.doc.gov/category/minority-broadband-initiative.

[7] Evidence from large surveys conducted regularly by the Census Bureau are summarized by the NTIA's *Digital Nation Data Explorer* (available at: https://www.ntia.gov/data/digital-nation-data-explorer#sel=internetUser&demo=income&pc=prop&disp=chart). Recent evidence is provided in the *Internet/Broadband Fact Sheet*, PEW RESEARCH CENTER (April 7, 2021) (available at: https://www.pewresearch.org/internet/fact-sheet/internet-broadband/?menuItem=6ba9316e-006c-482d-be4b-69feb64c4be8).

[8] The terminology used to identify racial groups is subject to some controversy. Here, I use the terminology used by the U.S. Census Bureau. *Also see, e.g., Inclusive Language Guide*, Department of Diversity Initiatives, University of South Carolina-Aiken (undated) (available at: https://www.usca.edu/diversity-initiatives/training-resources/guide-to-inclusive-language/inclusive-language-guide/file).

adoptions, or are there cultural differences across racial groups unrelated to such resources? Decomposition provides an answer.

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Borrowing notation from Jann (2008), say there are two groups, A and B.[9] The difference is mean outcomes between the two groups is,

$$\Delta = E(Y_A) - E(Y_B) \tag{1}$$

where $E(Y)$ is the expected value of the outcome. Explaining the outcome (Y) using a linear model,

$$Y_k = X_k'\beta_k + \varepsilon_k \tag{2}$$

where k is a group index, X is a vector of predictors (including a constant), β contains the estimated parameters, and ε is the zero-mean error term. The difference is means is,

$$\Delta = E(X_A)'\beta_A - E(X_B)'\beta_B . \tag{3}$$

Where each group has its own resources (X) and coefficients (β). As is common in the literature, this difference may be decomposed into two parts ($\Delta = \Delta_1 + \Delta_2$), where,

$$\Delta_1 = E(X_A - X_B)'\beta^* , \tag{4}$$

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[9] B. Jann, *A Stata Implementation of the Blinder-Oaxaca Decomposition*, 8 THE STATA JOURNAL 453-479 (2008) (available at: https://core.ac.uk/download/pdf/6442665.pdf). Jann (2008) provides a suitable review of the literature and Jann's `oaxaca` command for Stata is used to estimate the decompositions.

and,

$$\Delta_2 = E(X_A)'(\beta_A - \beta^*) - E(X_B)'(\beta_B - \beta^*), \quad (5)$$

where β* is a reference set of coefficients.[10] The first part of the difference, Δ_1, in Equation (4) is the portion of the difference *explained* by differences in socio-economic resources (the *X* variables). That is, if adoption by groups A and B respond to their resources in the same way, then how much of the difference in adoption is related to differences in socio-economic resources? The second part of the difference, Δ_2, in Equation (5) is the *unexplained* portion. This unexplained portion of the differences is measured by the differences between the groups related to how the socio-economic resources affect adoption (as measured by the coefficient vectors).

III. Data

Data on broadband subscription is obtained from the *Computer and Internet Use Supplement* to the Current Population Survey ("CPS") for years 2017 and 2019.[11] The CPS in the largest available collection of data on U.S. broadband adoption. The sample is limited is several ways. First, I limit the analysis to adult respondents (18 years or older). Second, I exclude from the sample persons who report broadband access is not available. Third, respondents with missing data are excluded.

For each household, the dependent variable indicates whether the home has broadband access cable modem, Digital Subscriber Line ("DSL"), or fiber optic service.[12] Note that the question does not imply that the household has "broadband" as defined by the Federal Communications Commission ("FCC"), which at the time was a service capable of 25 Mbps

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[10] An assortment of reference β vectors are used in the literature. Here, I begin by using the parameter vector for Whites. Neumark (1988) proposes the use of the pooled coefficients for β*, including a dummy variable for the groups to account for differences in the mean errors, and I also use that approach here. D. Newmark, *Employers' Discriminatory Behavior and the Estimation of Wage Discrimination*, 23 THE JOURNAL OF HUMAN RESOURCES 279–295 (1988).

[11] The data are available at: https://www.ntia.doc.gov/page/download-digital-nation-datasets. A data dictionary is provided at: https://www.ntia.doc.gov/files/ntia/publications/november-2019-techdocs.pdf. The NTIA's Data Explorer provides summary statistics computed from the data over the several years it has been collected (https://www.ntia.doc.gov/data/digital-nation-data-explorer#sel=wiredHighSpeedAtHome&disp=map).

[12] The variable used is HEHOMTE1 ("I am going to read a list of ways that people access the Internet from their homes, other than a mobile data plan. At home, (do you/does anyone in this household) access the Internet using: High-speed Internet service installed at home, such as cable, DSL, or fiber optic service?").

download speeds and 3 Mbps upload speeds.[13] This definition excludes satellite based and dialup Internet services. Racial groups, using the terminology of the CPS, include Whites, Hispanics, Blacks, Asians (including Pacific Islanders), Multi-Racial Americans, and Native Americans.[14] Explanatory variables used in the statistical analysis include family income, age in years of the respondent, five education indicators (high school only, some education after high school but no degree, an associate's degree, a college degree, and an advanced degree), an indicator for respondents living in a metropolitan area of more than one million persons, an indicator for whether the respondent lives in an area classified as rural, and indicators for whether the respondent uses the Internet at work or at school.[15]

Table 1 provides the descriptive statistics of the sample. In the first two rows, average adoption rates for each racial group are provided in addition to the difference from Whites. All groups but Asians have a lower adoption rate than Whites (a 2.7 percentage point difference), though the difference for the Multi-racial group (1.2 percentage point) is not statistically different from that of Whites (in a regression-based means difference test). Adoption rates for Hispanics (5.9 percentage points) and Blacks (4.4 percentage points) are somewhat below that of Whites, though the largest difference in adoption is for Native Americans with an adoption rate 12.2 percentage points lower than Whites. Adoption rate differences from the pooled mean are similar and all differences are statistically different from zero at the 1% level except for the Multi-Racial group (which is not statistically different from zero even at the 10% level).

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[13] *Fourteenth Broadband Deployment Report*, Federal Communications Commission (January 19, 2021) (available at: https://docs.fcc.gov/public/attachments/FCC-21-18A1.pdf).

[14] The self-identified racial group variable (PTDTRACE) includes: White Only, Black Only, American Indian, Alaskan Native Only, Asian Only, and Hawaiian/Pacific Islander Only. Native Americans are defined to include both American Indian and Alaskan Native groups. The multi-racial group is defined to include any combination of the above. Hispanic origin is determined using the variable PEHSPNON, which has values: Hispanic and Non-Hispanic.

[15] The variables used are HEFAMINC (for income); PRTAGE for age; PEEDUCA (for education); GTCBSASZ (for metropolitan size); GTMETSTA (for rural); HEINWORK (for Internet use at work); and HEINSCHL (for Internet use at school). Income data is provided in a grouping format that is converted to a continuous variable using the mid-point of each group; the top-coded value ($150,000 or more) is set to $200,000. The results are little affected by treating the groupings as a continuous variable. Multiple metropolitan size variables included in preliminary regressions but the model tested down to a single dummy variable.

Table 2. Descriptive Statistics

	Average	Whites	Hispanics	Blacks	Asians	Multi-racial	Native Amer.
Adoption	0.863	0.876	0.817	0.832	0.903	0.864	0.754
Diff. from Whites	-0.013	…	-0.059	-0.044	0.027	-0.012	-0.122
Diff. from Mean	…	0.013	-0.046	-0.031	0.040	0.001	-0.109
Family Income ('000)	79.35	85.59	62.54	60.16	96.33	79.67	59.34
Age	48.10	50.38	42.27	46.09	45.19	41.31	45.72
No High School	0.102	0.061	0.265	0.110	0.089	0.078	0.141
High School	0.286	0.279	0.317	0.337	0.185	0.262	0.369
High School plus	0.279	0.288	0.245	0.314	0.197	0.347	0.323
College Degree	0.213	0.237	0.124	0.153	0.310	0.206	0.111
Advanced Degree	0.120	0.135	0.049	0.086	0.220	0.107	0.056
Metro ≥ 1mil	0.564	0.496	0.690	0.656	0.803	0.520	0.313
Rural	0.128	0.164	0.047	0.088	0.022	0.128	0.323
Int. at Work	0.527	0.552	0.445	0.453	0.620	0.581	0.428
Int. at School	0.256	0.227	0.346	0.257	0.309	0.304	0.265
Year = 2019	0.504	0.500	0.510	0.506	0.514	0.510	0.521
Observations	155,696	110,122	19,035	13,789	9,282	2,096	1,372

Stat. Sig. * 10%, ** 5%, *** 1%. Unconditional means differences from Whites.

Inspection of Table 1 reveals that all the minority groups except Asians have lower incomes and less education than do Whites, though income for the Multi-racial Americans is comparable to Whites. All minority groups except Native Americans are more likely to live in large metropolitan areas and less likely to live in rural areas, while Whites and Native Americans are more likely (and often much more likely) to live in rural areas. All minority groups are younger, on average, than Whites. With broadband adoption positively correlated with things like income and education, it might be expected that the differences in socio-economic resources across racial groups will explain (at least) some portion of the difference in adoption rates. How much these differences in socio-economic resources explain differences in adoption is the purpose of the decomposition analysis.

IV. Decomposition Results

To calculate the explained and unexplained parts of the means differences in Equation (4), the first step is to estimate Equation (2). The dependent variable is dichotomous, so a natural choice for estimation is the Logit model. Prior to doing so, the racial group specific results are worth evaluating. The Logit model in weighted by the sampling weight for households from the CPS.[16] Summary results are provided in Table 2. For ease of interpretation, the marginal

[16] The sampling weight is HWHHWGT.

effects are presented (computed at the means). All the models have good explanatory power (the χ^2-statistics are all significant at the 1% level) and all the coefficients are statistically different from zero at the 1% or better, so the indicator stars are suppressed. For the regressors that are dichotomous, including the race indicators, the coefficients measure the change in the adoption rate when the regressor changes from zero to one. The size of these marginal effects suggests the relative importance of the regressors.

Table 2. Logit Regression Results, Marginal Effects

	Pooled	Whites	Hispanics	Blacks	Asians	Multi-Racial	Native Amer.
Hispanic	-0.040	…	…	…	…	…	…
Black	-0.031	…	…	…	…	…	…
Asian	-0.003	…	…	…	…	…	…
Multi-Racial	-0.008	…	…	…	…	…	…
Native Am.	-0.063	…	…	…	…	…	…
ln(Family Income)	0.054	0.059	0.030	0.047	0.064	0.053	0.032
ln(Age)	0.013	0.014	0.011	0.027	-0.006	0.002	0.032
High School	0.028	0.022	0.045	0.019	0.010	-0.037	-0.004
High School plus	0.055	0.044	0.086	0.054	0.031	-0.030	0.116
College Degree	0.069	0.060	0.104	0.067	0.047	0.028	-0.031
Advanced Degree	0.071	0.063	0.104	0.079	0.042	0.022	0.169
Metro ≥ 1mil	0.040	0.045	0.027	0.055	0.010	0.008	0.156
Rural	-0.058	-0.056	-0.058	-0.043	-0.018	-0.079	-0.005
Int. at Work	0.038	0.032	0.057	0.044	0.063	0.021	0.091
Int. at School	0.025	0.018	0.029	0.049	0.030	0.072	0.032
Year = 2019	-0.005	-0.004	-0.023	0.023	-0.019	-0.026	-0.019
Observations	155,696	110,122	19,035	13,789	9,282	2,096	1,372

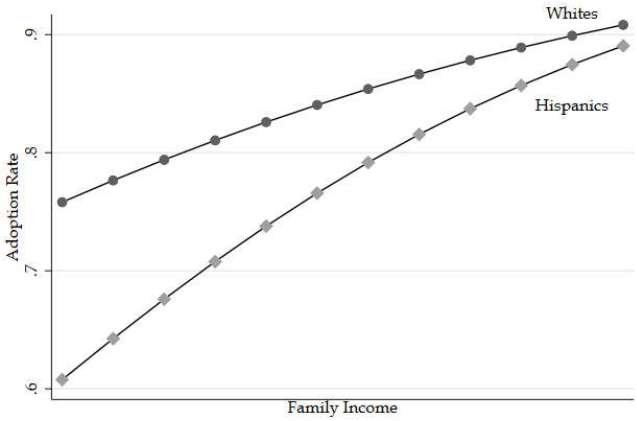
Significance indicators are excluded since all coefficients statistically different from zero at the 5% level or better.

All the race group identifiers are statistically-different from zero and negative.[17] The differences in the size of the coefficients from the simple means differences from Table 1 illustrate to some degree how socio-economic resources explain adoption differences. For instance, Native Americans have a simple means difference from the sample average of -7.8 percentage points, but the marginal effect is only -6.3 percentage points when conditioned on the regressors. However, pooled model assumes that the regressor coefficients are equal across all race groups, which these results indicate is not the case. Looking across the marginal effects from the Logit model for the racial groups, the marginal effects of the socio-economic resources differ across the groups. The marginal effects of income and age, both continuous variables, are not easily interpreted as it depends on what level of the variable the marginal effect is

[17] Additional analysis indicated the sign change is related to the geographic variables.

calculated. Figure 1 illustrates the estimated relationship between adoption and income for Whites and Hispanics. Across the range of incomes, adoption rises for Whites is 0.76 at the lowest income and 0.91 at the highest income, while for Hispanics adoption rises from 0.61 to 0.89 for Hispanics. At higher incomes, the difference in adoption between the two groups is relatively small but is large at lower incomes. For the dichotomous regressors, which are easier to interpret, the marginal effects are often large; for instance, a college education increases the adoption rate for Hispanics by 10.4 percentage points. It is clear, however, that the effect sizes vary, sometimes materially, by group. Looking at the descriptive statistics in Table 1, the marginal effects from Table 2, and Figure 1 suggests a decomposition may be productive: both socio-economic resources and the effects of those resources on adoption vary across racial groups.

Figure 1. Adoption and Family Income



For the decomposition, I first use the coefficients for Whites as the reference vector β*. Thus, the decomposition is performed with a comparison to Whites for all minority groups.[18] Results are summarized in Table 3.[19] With the exception of Asian Americans, Table 3 reveals that most

[18] Using Whites as the reference group in Digital Divide analysis is common. *See*, *e.g.*, N.T. Lee, *Bridging Digital Divides Between Schools and Communities*, BROOKINGS (March 2, 2020) (available at: https://www.brookings.edu/research/bridging-digital-divides-between-schools-and-communities); C. Campos-Castillo & L.I. Laestadius, *Racial and Ethnic Digital Divides in Posting COVID-19 Content on Social Media Among US Adults: Secondary Survey Analysis*, 22 JOURNAL OF MEDICAL INTERNET RESEARCH 20472 (2020) (available at: https://www.jmir.org/2020/7/e20472); *Falling Through the Net*, *supra* n. 3.

[19] The decomposition is also performed separately for years 2017 and 2019. The results are not qualitatively different. Details are available upon request.

of the means difference in adoption rates between the minority group and Whites is *unexplained* by the differences in socio-economic resources. For Hispanic and Black Americans, 83.4% of the difference in unexplained. For Multi-Racial Americans 69.9% is unexplained, and for Native Americans, 62.8% of the means difference is unexplained. Between White and Asian Americans, more than the means difference is explained by socio-economic factors and the unexplained portion is relatively small. Looking across Tables 1 and 2, Asian Americans have highly favorable socio-economic resources for broadband adoption.

Table 3. Decomposition Results
(White's Coefficients as the Reference β*)

	Hispanics	Blacks	Asians	Multi-Racial	Native Amer.
Mean Adoption Rate					
White	0.876	0.876	0.876	0.876	0.876
Minority Group	0.817	0.832	0.903	0.864	0.754
Difference	0.059***	0.044***	-0.027***	0.012***	0.122***
Explained	0.010***	0.007***	-0.031***	0.004***	0.045***
Share	16.6%	16.6%	116.8%	30.1%	37.2%
Unexplained	0.049***	0.036***	0.004***	0.008***	0.076***
Share	83.4%	83.4%	-16.8%	69.9%	62.8%
Stat. Sig. * 10%, ** 5%, *** 1%					

In Table 4, the reference vector β* equals the coefficients from the pooled model. These coefficients are based on all observations in the sample and will differ from the β vector for Whites. As such, the decomposition will change. Rather than reflecting differences from Whites, the decomposition in Table 4 represents the decomposition from the average American. Also, a decomposition for Whites is possible when using the pooled estimates as the references vector.

Table 4. Decomposition Results
(Pooled Coefficients as the Reference β*)

	Whites	Hispanics	Blacks	Asians	Multi-Racial	Native Amer.
Mean Adoption Rate						
Pooled Mean	0.839	0.872	0.867	0.860	0.863	0.864
Racial Group	0.876	0.817	0.832	0.903	0.864	0.754
Difference	-0.037***	0.054***	0.035***	-0.042***	-0.001	0.110***
Explained	-0.005	0.015***	0.011***	-0.033***	…	0.044***
Share	14.6%	28.0%	30.5%	77.8%	…	40.2%
Unexplained	-0.032***	0.039***	0.024***	-0.009***	…	0.065***
Share	85.4%	72.0%	69.5%	22.2%	…	59.8%
Stat. Sig. * 10%, ** 5%, *** 1%						

For all racial groups but Asians, the unexplained portion remains dominant. Only about one-quarter of the means difference for Asians is unexplained. The means difference is almost

fully unexplained for Whites (85.4%). For Blacks and Hispanics, about 70% of the means difference is unexplained. For Native Americans, the unexplained portion is about 60%, which is comparable to the results in Table 3. The means difference for Multi-racial Americans is not statistically different from zero (prob = 0.90); this group's adoption rate is nearly equal to the pooled mean adoption rate.

Comparing Tables 3 and 4 reveals the influence of the reference vector. In Table 3, the comparison uses Whites as the reference while in Table 4 the reference group is all Americans. Material changes across the two reference vectors are observed mostly for the Asian and Multi-Racial groups. Whichever reference coefficient vector is used, the differences in adoption rates is largely unexplained by differences in socio-economic resources for Hispanics, Blacks, and Native Americans.

In all, these results suggest that differences in socio-economic resources like income and education do relatively little to explain the differences in adoption rates among race groups. The demand for broadband varies along racial dimensions; or, put another way, *adoption is influenced by unobserved factors correlated with race.* It appears, therefore, that addressing the lack of adoption of the Internet at home may require remedial measures targeting specific minority groups rather than uniform policies that address socio-economic resources like income. What specific factors such targeted remedial measures address is beyond the scope of this analysis. Of policy options currently under consideration, direct subsidies for broadband service for low-income households is receiving the most attention.[20] Such subsidies aim to address affordability for low-income households. But resolving the effects of income differences, which are accounted for in the analysis, may not do much to close the Digital Divide as it relates to race.

V. Conclusion

As governments at all levels across the country attempt to close the Digital Divide along racial dimensions, an understanding of whether racial differences in adoption merely reflect variations in socio-economic resources or some other cultural (or unobserved) factors may be important. Socio-economic resources that positively affect adoption, such as income and education, do differ among racial groups, but the analysis here suggests the adoption differences among racial groups are not much explained by the differences in socio-economic resources. Such a finding may complicate the policy response to adoption. Direct subsidies for service aim to address mostly differences in income, but income differences to do not remedy

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[20] *C.f.,* D. Brake & A. Bruer, *Is the Link Between Internet Adoption and Broadband Pricing Overstated?* POLICY OPTIONS (April 16, 2021) (arguing that policymakers should focus on subsidies for low-income users) (available at: https://policyoptions.irpp.org/magazines/april-2021/is-the-link-between-internet-adoption-and-broadband-pricing-overstated).

the adoption deficit among minorities with lower average incomes. Over half the means difference in adoption is determined by factors other than income and several other observable determinants of broadband adoption. The policy response, it appears, must be nuanced, and nuance, unfortunately, is not the strong suit of federal bureaucracy.

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