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The purchase of Internet subscriptions in Native American households

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ABSTRACT

With the growing use of the Internet for information, education, job hunting, and other activities, its economic value increases. The incidence of in-home Internet subscriptions, however, varies across households, and Native American households are less likely than other American households to subscribe to Internet services. The lack of universality has, potentially, enormous consequences for households not subscribing to the Internet. Using descriptive statistics and logistic regressions we find that the growth of U.S. Internet subscriptions may have peaked and exhibited a small decline between 2012 and 2015; technology adoption has reached the third stage of the S-curve. Internet adoption in Native American households, however, may not have fully reached into the third stage. While rural-urban location is a small factor for non-Native American households, it remains a major factor for Native American households.

1. Introduction

While household Internet use is widely known for its social media activities as well as gaming and movie download undertakings, households are also using it for more far-reaching pursuits that contribute to their socio-economic well-being. For example, households conduct research on medical issues, complete school homework assignments, participate in continuing education, apply for jobs, file taxes online, and deal with their government's department of motor vehicles. Given the Internet's increasing contribution to a household's socio-economic well-being, those households remaining offline may be put to an ever increasing disadvantage vis-à-vis online households, widening the economic gulf between households.

Although household broadband Internet subscriptions have increased markedly since early in the millennium, the rate of growth in new subscriptions has declined greatly over the last 10 years and actually was negative between 2012 and 2015. This has left approximately 25 percent of all U.S. households still without in-home service. Native American households in the U.S. are even more likely to remain without in-home access than the general population. The lower uptake has become such a concern that the U.S. National Broadband Plan (FCC, 2009) suggested the Federal Communications Commission establish an department specifically to "bring the benefits of a modern communications infrastructure to all Native communities by, among other things, ensuring robust government-to-government Consultation with Federally-recognized Tribal governments and other native organizations" and to "develop and implement policies for assisting native communities" while "ensuring that Native concerns and voices are considered in all relevant Commission proceedings and initiatives."

The research here explores the relatively low rate of uptake in Native American households. The existence of differences offers one argument for taking nuanced policy approaches for Native American households. The paper is organized around five basic elements. The

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first presents an examination of previous research and how this research builds on it. The second is a description of the data employed in the study. Third is a descriptive analysis – snapshots of comparison between Native American households and the rest of the country – and builds a case for further analysis. Fourth, a more in-depth look using logistic regression models for both subpopulations. The models show some differences across parameters and build a case for a formal treatment of cross-cultural differences. The last presents the conclusion.

2. Background

From the beginning of the modern Internet era 25 or so years ago concern has been expressed for regions and households that were late adopters. Parker and Hudson (1992), in their seminal study, showed that rural communities had a relative paucity in modern telecommunication services, especially in the technology, called dial-up, which was the dominant mode households connected to the Internet at the time, than the more highly urbanized parts of the country. They argued that rural areas would be increasingly marginalized in the economy if they lagged or remained off the Internet. The data they used, however, was primarily anecdotal, with much conjecture on what the Internet might mean to the general economy. Oden and Strover (2002) in their study brought more substance in the discussion of the need for Internet services and the role Internet services have for economic development, in their case, specifically, the Appalachian region.

Into this debate came the National Telecommunication and Information Administration (NTIA) studies. Beginning in 1994 the NTIA, in cooperation with the Bureau of the Census and Economics Statistics Administration, started collecting data on computer and Internet use by households. The 1997 NTIA report, in fact, led to spreading the term "digital divide" into its now familiar place in the telecommunications policy lexicon. The NTIA data has shown the fast rate of uptake by households, first in the dial-up access period, and, beginning in the new millennium, the quick adoption of broadband technologies now used in nearly all households with Internet access. Roughly 25 percent of all households, however, remain, effectively, without in-home Internet access. The 25 percent are neither uniformly spread across rural-urban space nor across racial and ethnic groups.

2.1. Studies of Internet adoption

Most of the early Internet adoption research focused principally on household Internet subscriptions and provided little insight into the determinants of consumer adoption or rejection, let alone the Internet's post adoption impact (Carriere, Rose, Sirols, Turcotte, and Zabbal (2000); Horrigan (2001); Lebo (2001); Parker (2000)). The NTIA reports taken as a whole, however, assemble the most comprehensive, descriptive and broad, portrait of changes in Internet usage. The NTIA reports highlighted a few factors associated with purchasing Internet access – income, education, race, and age – but the relationships are not simple and straightforward, and considerable interactive effects also are implicitly apparent. The reports are not analytical in nature, nor were they ever meant to be, but their broad findings are generally supported by academic research.

Broadband Internet adoption studies at the beginning of the millennium by Leamer and Storper (2001); Lee, O'Keefe, and Yun (2003); Choudrie and Lee (2004); and others focused on macroeconomic level factors leading to adoption in a country. Oh et al. (2003); Choudrie and Dwivedi (2004); Stanton (2004); Rosston, Savage, and Waldman (2010); and other researchers stressed the need to understand adoption and diffusion of broadband at the household level.

Later household Internet studies by Choudrie and Dwivedi (2005, 2006); Mills and Whitacre (2003); Savage and Waldman (2005); and Stanton (2004) tested socio-economic factors distinguishing adopters and non-adopters of computers and Internet use. Choudrie and Dwivedi (2005) found age, gender, and social class were important when distinguishing between British adopters and non-adopters of the Internet. Choudrie & Dwivedi, 2006 British study also found that characteristics such as income and education were important factors. Flamm and Chaudhuri (2007) introduced a price proxy into the equation. Stanton (2004) formally tested the existence of a "digital divide" and found it the widest for computer ownership and the narrowest for Internet connections.

Pepper (2002) noted that the growth in broadband Internet subscriptions during the "early adopter" period from 1998 to 2001 outpaced color television, pagers, cable TV, cellular phones, and VCRs, as well as dial-up Internet service. The U.S. General Accounting Office (2001) marked government researchers' early understanding of federal Internet policy and the choices made by consumers. These early studies took place during a period of a rapid broadband technology uptake by households. Flamm and Chaudhuri (2007) showed broadband was a substitute for dial-up.

The rate of Internet service uptake has slowed down appreciably in the last 5 years (Horrigan, 2013; NTIA, 2013). One reason – some households still cannot obtain a terrestrial broadband connection.[2] Most of the cause for the flat-lining of growth, however, is by choice. Many households have chosen not to obtain in-home Internet service. As a consequence, the issue of broadband Internet availability have lessened while the issues of quality of service and Internet nonadoption has risen to become the crux of America's policy debate on equal access. The policy debate on broadband uptake, it is argued, needs to be informed through sound empirical analysis of broadband Internet awareness and access, and specific information about consumer behavior toward broadband Internet subscription.

Fairlie (2004); Li, Turner-Lee, Gambhir, and Baek (2011); and Prieger and Hu (2008) treated cultural groupings as an explanatory variable in their research to understand household demand factors for Internet services, and have shown there are differences between the groups in the likelihood of uptake. In this research, unlike in previous studies, we separate Native American households from the rest

[2] Terrestrial connections take place through wireless or wired broadband technologies using devices ranging from the old personal computer platform to any smart phone device.