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Monthly condensed analyses of crucial real estate and economic issues offered by UCLA Anderson Forecast and UCLA Ziman Center for Real Estate. In this April 2023 Letter, UCLA Anderson School of Management Finance Ph.D. candidate Edward T. Kim calculates the benefits of high-speed broadband to low-income households when refinancing.

This Economic Letter is extracted from a larger report: The Digital Divide and Refinancing Inequality. The full report includes all citations and graphs.

The Digital Divide and Refinancing Inequality

Underserved and low-income households benefit materially from improved broadband access

By Edward T. Kim

Mortgage refinancing is an important mechanism for household wealth accumulation in the United States; however, many Americans do not refinance their mortgages when interest rates fall. This phenomenon is concentrated among low-income and minority households, implying a potential imbalance in the effectiveness of accommodative monetary policy during economic downturns and increased wealth inequality.

High-speed Internet can significantly reduce the indirect costs associated with applying to refinance a mortgage. Using the Internet, an applicant can easily exchange paperwork by email, link financial accounts online to expedite credit verification, and spend less time meeting with a loan officer or visiting a bank branch. Indeed, processing times for mortgage applications at online lenders are estimated to be 15 to 30 percent shorter than at their physical counterparts, with a larger effect for refinance loans. Online resources only allow households to obtain information about the value of refinancing and relevant application procedures.

Despite the Internet's large role in streamlining the refinance process, it is inaccessible to millions of American households living without a wired broadband connection at home. The persistent gap in access to information technology, known as the "digital divide," has become an important policy issue. In 2019, less than 70 percent of the population reported having a broadband subscription at home, with low-income households reporting significantly lower subscription rates. This trend is not entirely driven by the lack of physical access to a broadband provider; of the low-income households living in urban areas with near-complete broadband coverage, only 65 percent subscribed to broadband during this period.

To address empirical challenges in quantifying the effect of broadband access on refinancing, I analyze the Internet Essentials program by Comcast, one of the largest broadband providers in the United States. Introduced in 2012, Internet Essentials heavily subsidized broadband subscription fees to qualifying low-income households. The monthly cost of $9.95 was up to 75 percent lower than that of a comparable regular plan, and all fees related to activation and equipment were waived. The program became highly successful, connecting 750,000 American families (or 3 million individuals) nationwide in the first five years (Comcast Corporation, 2016). Internet Essentials is a suitable setting to study refinancing inequality due to its unique properties. First, the program allows for the comparison of refinance outcomes across geographic areas with similar demographic and economic characteristics. Second, Internet Essentials was directly aimed at increasing broadband take-up by low-income households making less than around $40,000 per year — the group that exhibits low refinancing behavior most prominently. Last, the program coincides with the prolonged recovery period after the Great Recession when the potential monetary savings from refinancing would have been particularly high.

> *"Proper access to broadband by low-income households improved their refinance outcomes following the Great Recession, resulting in a 5 percent increase in monthly disposable income and wealth gains of up to $18,000."*

Using household-level variation in Internet Essentials eligibility, I find that improved broadband access leads to a strongly positive impact on refinance outcomes. Both the number of submitted refinance applications and originated loans increased by 6 percent as a result of the program; importantly, the results are driven by behavioral changes along the extensive margin (increased likelihood of refinancing) and not through differential effects along the intensive margin (lower interest rates). I corroborate these baseline findings with survey-based evidence of decreased mortgage payment burdens. In addition, I show that the results are in large part driven by census tracts with limited access to physical bank branches, implying that broadband promotes access to financial services for the underbanked. The effects are also stronger for households with low educational attainment, which highlights the role of digital and financial literacy in refinancing.

The economic magnitudes of these results are significant: the average low-income household that refinanced its mortgage between 2012 and 2015 would have saved up to $100 per month on mortgage payments even after accounting for the nominal cost of broadband subscription. This translates to a 5 percent increase in monthly disposable income and total household wealth gains of up to $18,000, which accounts for about 10 percent of the average net worth of homeowners in this income bracket. I estimate that the program generated up to $100 million in additional refinance savings across Comcast area households and potentially reduced refinancing inequality by up to 14 percent.

CONCLUSION: INSTITUTIONS CAN BRIDGE THE DIGITAL DIVIDE

This paper has important implications for monetary policy, mortgage contract design, and infrastructure initiatives. First, the pass-through of accommodative monetary policy via refinancing may be hindered by low demand among households without Internet access. Since the digital divide persists along the income dimension and in less developed areas, the consequences of failing to refinance for disadvantaged groups can be amplified during economic downturns. Moreover, a housing market that is dominated by fixed-rate mortgages exacerbates wealth inequality by placing the burden of refinancing solely on households. Over the past several decades, low-income and minority families have been stymied by the mismatch between strong homeownership preferences and the lack of ability or resources to refinance when interest rates fall. To address this, the institutions may consider developing alternative mortgage products for these populations that dynamically induce refinancing behavior. Lastly, large-scale efforts to get Americans connected to broadband should continue via expanded physical access and improved network affordability.

Access to high-speed Internet is one of the most prominent equalizing forces in the modern era. As technology continues to evolve, the new front of financial inclusion will depend less on introducing branches and ATMs to neighborhoods and more on connecting people via personal devices. While this paper addresses the Internet's key role bridging the wealth gap in the context of mortgages, additional consideration should also be given to its impact on other aspects of household finance such as savings and investment behavior.

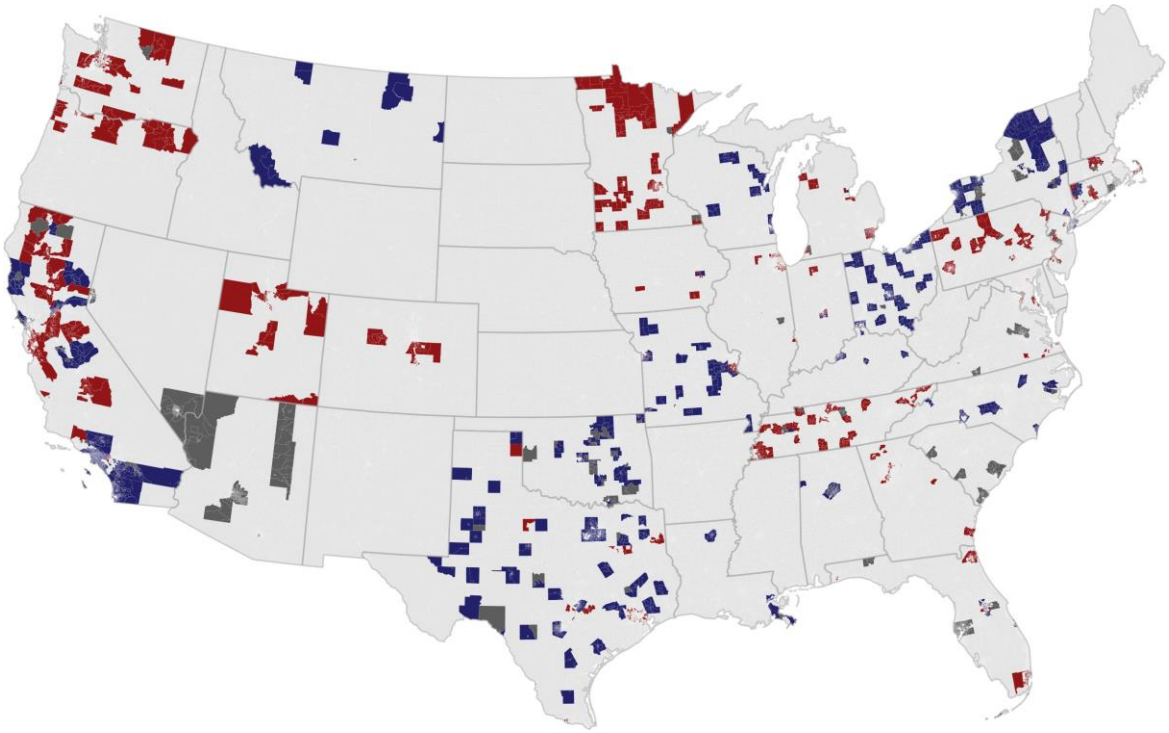

Figure: Map of Comcast Coverage

This figure plots the statistical and geographical distributions of Comcast coverage in metropolitan census tracts. I compare the refinance outcomes of program-eligible and ineligible households across Comcast (red) and no Comcast (blue and grey) tracts around 2012. Source: NTIA SBI, NCHS.