Banking the Unbanked: Bank Deserts in the United States

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Abstract

Low-income and rural households often lack access to bank accounts. While research has focused on the damage created by this lack of access and potential solutions available, there is little empirical evidence on the location or characteristics of what we label "bank deserts." The lack of access created by these deserts causes high transactions costs for basic financial services as alternative financial service providers fill the financial services gap. The prior literature focuses on these challenges by focussing on individuals and families, rather than on location. We fill in this missing piece of the puzzle, using zip code demographics and bank branch data, and provide estimates of the determinants of bank deserts, defined as having less than .02 branches per 1,000 in population and sufficient population to make a bank office or offices viable. Around 350 urban and 650 rural bank deserts are identified. For a variety of specifications, it is found that minorities, African Americans, and Hispanics are each significantly more likely to live in a bank desert, with size effects that are economically meaningful. Hispanics living in rural areas exhibit the highest risk for living in a bank desert.

Introduction

Approximately 20% of U.S. household use alternative financial services for transactions that can typically be performed at a far lower cost by the traditional, formal banking system (FDIC, 2014; OIG, 2014). Most of the relevant literature has analyzed the characteristics of the unbanked or underbanked individuals or households. Less emphasis has been given to the issue of geography, and specifically whether the unbanked and underbanked have local access to the formal bank system. We refer to relevant geographic gaps as "bank deserts," which is derived from the notion of "food deserts," or areas "without access to fresh, healthy, and affordable food" (USDA, n.d.). In both cases, it seems likely that these deserts are closely connected to poverty and to people of color. Additionally, the lack of depository institutions, akin to the absence of supermarkets, may force residents to pay higher prices for lower-quality products (e.g., with convenience stores or payday lenders).

This paper analyzes zip codes that contain bank branches and where there are no or a limited number of bank branches as a proportion of the population to identify bank deserts. The analyses are performed separately for urban and rural areas because the challenges of servicing sparsely populated rural areas make them unique. Relatedly, we impose a strict population cut-off for rural areas (5,000 in population), to ensure that any call to expand bank branches into rural areas is not literally calling for expansion into a deserted part of the nation. For both urban and rural areas, the average characteristics of bank desert zip codes and non-bank deserts are compared in terms of bank branches, race and ethnicity, poverty, income, and population. We formally attempt to isolate the effects of race/ethnicity and income on the probability of a bank desert existing in urban or rural

areas, and simulate the effects of shifting the proportions of minorities, African Americans or Hispanics on these probabilities.

Literature

The recession of 2008 demonstrated the essential role that banks play in American society. However, there is a large group of individuals that do not participate due to lack of access, or that do not have the means to meet minimum balance requirements. These individuals are referred to as the unbanked or underbanked, which are people that have seldom or never held a transaction account, including checking, savings or check cashing, at any depository institution (FDIC, 2014). These individuals may reside in areas with limited access to depository institutions, or have no access at all, and use alternative financial services. A survey by the FDIC in 2013 found that 1 in 13 households do not use a bank, which translates to 9.6 million households in the U.S. The Office of the Inspector General for the US Postal Service found that 20% of the households are underserved and 8% are completely unbanked (OIG, 2014). Distance to bank branches (Ho and Ishii, 2011) and branch density (Dick, 2006, 2008) have been shown to impact demand for banking services and consumer welfare.

The literature has also found that poverty is correlated with a lack of access to finance at a national level (c.f. Honohan, 2004, Beck et al., 2007, Demirguc-kunt et al., 2008). Honohan (2008) showed that poverty and inequality are strongly influenced by the degree to which low income households have access to savings, risk-pooling and payment services provided by the formal financial sector. Burhn and Love (2014) studied the impact of improved access to finance from the simultaneous opening of over

800 branches by Banco Azteca in Mexico. The bank targeted savings accounts and loan services mainly to low-income individuals and business owners in the informal sector of the economy. The authors found positive effects that were most pronounced for people with below average salary levels, and in districts that were underserved by the formal banking sector before Azteca's opening. They also demonstrated that per capita GDP expanded subsequent to the branch expansion of Banco Azteca, which further fortifies the case for the positive effect of access to financial services.

Claessens (2007) identified on a global scale that a lack of access to the formal banking system has not been regarded as a public policy priority. High deposit requirements and fees may inhibit individuals from accessing those services. In addition, banks often require insurance or collateral when individuals apply for certain loans, which low-income individuals tend not to have. These findings are consistent with the observation of DeYong et al. (2008), that small businesses located in low-income and predominantly minority communities can find it difficult to gain funding for creditworthy projects because lenders lack credible information about these firms.

If banks do not see an area as profitable, they may not pursue business in that area. Adding to this basic logic is a recent decline in the number of brick and motor bank branches. The number of brick and motor bank branches decreased from 100,000 in 2009 to approximately 98,000 in 2014 (FDIC, 2014). The lack of a brick and mortor bank branch that provide affordable banking may lead households to rely on alternative financial services such cash checking, remittances, pay day lending, pawn shops, rent-to-own agreements, and similar products (OIG, 2014). DeYong et al. (2008) show that the distance between small business borrowers and their lenders has substantially increased;

moreover, this increase was disproportionately large for borrowers located in low-income and minority neighborhoods. Together, these finding suggest both that we may local numerous bank deserts within the United States, and that these bank deserts are associated with high costs for financial services being imposed upon those least able to afford those costs.

Some prior studies attempt to characterize the demographics of the under- and unbanked. Based on data from Los Angeles and New York, Caskey et al. (2006) estimate that 79% of unbanked households are below the median income. The FIDC (2014) found that the demographics of the underserved disproportionately include low-income, African-American, Latin households. These findings provide important clues as to where we will find bank deserts: where racial and ethnic minorities live, and where incomes are low.

Data

We obtain demographic data on a total of 31,859 zip codes in 2010 from SNL. The dataset includes all zip codes nation-wide. Bank branch data comes from the FDIC's Summary of Deposits (SOD) database. Considering that markets are likely to diverge between rural and urban areas, we split the data into rural and urban areas according to the U.S. Census definition: urban areas have a population density of more than 1,000 persons per square mile.

Tables 1 and 2 show summary statistics for the subsamples (these exclude urban areas with less than 2,000 in population and rural areas with less than 5,000 in population, as explained below). The branch dummy equals 1 if the zip code has a bank

branch and 0 otherwise. As shown in Tables 1 and 2, about 94% of the zip codes in urban areas have one or more bank branches. The average number of bank branches equals 7.9, while in rural areas, 90% of zip codes have one or more brank branches. On average, there are five bank branches in a zip code. The demographics of the rural areas differ from those of urban areas. On average, each zip code has a 22.9% minority population in rural areas, and 42.9% in urban areas. The average percentage of households under 50% of poverty line in a zip code is 8.9% in urban areas and is 9.0% in rural areas. Zip codes in urban areas also have a higher proportion of Black and Hispanic individuals. The average household per capita income per zip code in urban areas is $33,700, while it is $28,400 in rural areas.

Methods

In urban areas, the average number of branches per 1,000 residents is 0.5. We define a bank desert as having less than .02 branches per 1,000 residents, or less than one-tenth of the mean. There are 468 urban bank deserts by zip code. However, many of these zip codes represent large government facilities (for example, the Naval Research Lab in Washington, D.C.) or industrial parks. Therefore, we apply a population minimum of 2,000 to eliminate these areas. For rural areas, we apply a cut-off of 5,000 in population to ensure that there is a sufficient market for bank services in the zip codes. Applying these definitions, we identified 351 bank deserts in urban areas and 654 bank deserts in rural areas. Alternative cut-offs are used later for testing. The mean characteristics of bank deserts and non-bank deserts are compared separately for urban and rural areas.

To isolate the effects of specific characteristics, we estimate binary logit models to examine how the demographics of the zip codes alter the prevalence of bank deserts, using robust standard errors to counter any heteroskedasticity in these data. To avoid multi-collinearity problems while maintaining a focus on race and ethnicity, we estimate the following two equations separately,

$$Bank\ Desert_i = f(minority_i, income_i, income_i^2, population_i) + \varepsilon_i$$

$$Bank\ Desert_i = f(Black_i,\ Hispanic_i, income_i, income_i^2, population_i) + \varepsilon_i$$

Minority is the percentage of population in the zip code that is minority (African American, Hispanic, Asian American, or Native American). *Black* is the percentage of African Americans in a zip code, and *Hispanic* is the percentage of Hispanics (non-African American) in the population. $Income_i$ is average per capita income in the zip code. We include a squared $income_i$ term as a control for extremely wealthy areas. Zip codes with more minority, Black and Hispanic individuals have been historically underserved by financial institutions, so we expect to see positive coefficients on these independent variables. Banks should find servicing high income neighborhoods more profitable, so we expect to see a positive coefficient on *income*. However, that effect may diminish as income rises to high levels; therefore, we expect to see a negative coefficient on $income_i^2$. We include the zip code's *population* as a control, and it should attract a negative coefficient. Note that the poverty rate is excluded because it is collinear with both the race/ethnicity variables and income.

Characteristics of Bank Deserts

Tables 3 and 4 provide the demographic characteristics of bank deserts compared with non-bank deserts for urban and rural areas, respectively. In the 351 urban bank deserts, only 5% have a bank branch. The average number of bank branches in these zip codes is 0.05, while the average for other urban areas is eight. The representation of minorities, African Americans, and Hispanics are each above the overall average in urban bank deserts (49.2% compared to 41.5%, 20% compared to 15.1%, and 21.1% compared to 17.3%, respectively). The average poverty rate in these bank deserts is higher than the overall average and average household per capita income is lower. Rural bank deserts share similar characteristics. In the 654 rural bank deserts, the average number of bank branches is only 0.002, while the average in other rural areas is above five. The average proportions of minorities, African Americans, and Hispanics in these bank deserts are each above the average for other rural areas (30.2% compared to 22.2%, 10.7% compared to 8.5%, and 13.1% compared to 9.0%, respectively). However, the average poverty rate and average household income in the rural bank deserts are not much different than the average for other rural areas.

The states where urban and, separately, rural bank deserts tend to be located are provided in Table 5. Not surprisingly, states with some of the largest cities are prominent among those with urban bank deserts, including California, Texas, New York, Pennsylvania and Ohio, while states with large rural areas tend to rank higher on the rural list. Those states include Florida, California and Texas, but also Georgia, Alabama, and North Carolina. The restriction of rural bank deserts to zip codes with at least 5,000

residents explains why several sparsely populated states, such as Alaska, Montana and Wyoming, include few or no rural bank deserts (i.e., seven, three, and zero, respectively).

For urban areas, a count of bank deserts in Census Bureau Combined Statistical Areas is provided for those with at least eight in Table 6. Again, the results implicate some of the largest cities in the nation, including New York, Los Angeles, and the Washington, DC, area. Some areas with high concentrations of minority residents are missing from the list, but not entirely immune; for example, the Miami-Fort Lauderdale-Port St. Lucie area in Florida includes seven urban bank deserts, while Detroit-Warren-Ann Arbor, Michigan, has four urban bank deserts.

Regression Results

The basic logit estimates are displayed in Tables 7. The signs on most independent variables are consistent with our expectation. For urban areas, in the first two numeric columns, the minority and Hispanic coefficients are positive and significant for the prediction of bank deserts, although the Black coefficient does not achieve significance. Income has the expected effect of reducing the probability that a bank desert will exist, but the effect reverses at very high income levels, and population is negatively related to bank deserts as expected. For rural areas, all three race/ethnicity variables are significant and in the expected positive direction. The significant income effect has disappeared, although the negative correlation with population retains significance.

Size effects are estimated by calculating the estimated probability of a bank desert existing as either the percent minority rises from 20% to 60%, the percent black rises from 0% to 30%, or the percent Hispanic rises from 0% to 30%, holding all other

variables at their mean values. These particular values are chosen because they approximate one standard deviation below and above the urban mean values (see Table 1). For the urban estimates reported in Table 7, the simulations reveal that the increase in the minority population increases the bank desert probability from 4.8% to 7.0%, while increases in the black or (separately) Hispanic population raise that probability from 5.5% to 6.5% and from 5.0% to 6.9%, respectively. For the rural areas, those same shifts result in increases from 8.0% to 20.8% for minority composition, 7.5% to 13.4% for black composition, and 6.9% to 15.0% for Hispanic composition.

As a specification test, the regressions were replicated after raising the branches per 1,000 in population cut-off from .02 to .04. Separately, the population cut-off was raised from 2,000 to 4,000 in urban areas, and from 5,000 to 8,000 in rural areas, and the regressions repeated. For both urban and rural areas, the rationale for increasing the cut-off is that, if the main results continue to hold, the case for the viability of a bank office or offices placed in a bank desert is strengthened.

The results for urban areas appear in Table 8. For the case where the branch density cut-off rises to .04, 458 bank deserts are now found while, with the population cut-off of 4,000, 300 bank deserts are identified. In these cases, the three race/ethnicity variables are positive and significant across the specifications. The income and population coefficients retain sign and significance as before for the urban results.

Simulations for raising the branch cut-off from .02 to .04 in urban areas reveal that raising the proportion of minorities from 30% to 60% is predicted to raise the probability of a bank desert existing from 5.4% to 9.3%. Increasing the proportion of African Americans or Hispanics raises the proportion from 6.8% to 8.7% and from 5.8%

to 9.2%, respectively. Comparable figures after restricting urban populations to at least 4,000, find the minorities bank desert probability rising from 3.8% to 6.3%, with increases from 4.6% to 5.9% for African Americans, and from 4.2% to 6.2% for Hispanics.

Comparable results for rural areas appear in Table 9. Raising the branch density cut-off to .04 leaves a total of 698 rural bank deserts, and separately increasing the population cut-off to 8,000 yields 272 bank deserts. As before, all three race/ethnicity coefficients are positive and significance regardless of the specification. The income coefficients remain insignificant as before, with the negative, significant population coefficient also remaining.

In terms of the simulations for rural areas, raising the branch cut-off from .02 to .04 yields a minority effect of raising the bank desert probability from 8.4% to 22.3%, an African American expansion from 8.0% to 14.3%, and a Hispanic expansion from 7.3% to 16.0%. Increasing the population cut-off from 5,000 to 8,000, has the effect of yielding a minority increase from 4.3% to 13.3%, with an African American increase from 4.2% to 8.7%, and a Hispanic increase from 3.9% to 9.0%.

Discussion

Under any criterion employed here, we identify hundreds of bank deserts in urban areas and hundreds more in rural areas. Both urban and rural bank desserts are characterized by higher proportions of minority, African American and Hispanic residents. Further, these differences are economically meaningful. Increasing the proportion of minority residents from 20% to 60% is estimated to increase the probability of an urban bank

desert by 2.2% and of a rural bank desert by 12.8%. Given the historical legacy of slavery and discrimination against African Americans, it is not surprising that we find an increases from 0% to 30% in the African American population increasing the odds of finding a bank desert by 1% in urban areas and 5.9% in rural areas. It is, however, somewhat surprising to find larger effects for identical estimates for Hispanics, with a parallel increase yielding a 1.9% figure for urban areas and an 8.1% figure in rural areas. Increasing the cut-off for bank branches per 1,000 residents from .02 to .04 to define bank deserts increases each of the probabilities just mentioned, with the finding of a larger Hispanic effect remaining.

Differences between urban and rural areas are also notable. Even with the higher population cut-off for rural areas (5,000, compared to 2,000 for urban areas), almost twice as many bank deserts appear in rural areas. Given that rural areas are, by definition, less densely populated, that finding is hardly surprising. But population density cannot help to explain why the race/ethnicity effects are at least twice as large in rural areas, even if those estimates are restricted to rural zip codes with at least 8,000 residents. One possible culprit is the significant, curvilinear effects of income in urban areas, with rising incomes first reducing and ultimately increasing the probability of finding a bank desert. Given that income is correlated with race/ethnicity, the urban logits reported in Table 7 were replicated after excluding the income terms. Simulations indeed found larger effects as expected: increasing the minority population is now estimated to increase the probability of a bank desert from 3.6% to 8.2%, which yields a difference over twice as large as the original 2.2% difference. Projected differences for increasing the African American or Hispanic population rise from 1% to 2.8% and from 1.9% to 4.0%,

respectively. Nonetheless, these larger figures remain smaller than the estimated race/ethnicity effects in rural areas.

Why Hispanics living in rural areas are those most likely to find themselves in a bank desert remains an important question for future research. Regardless of what that research may find, however, the work here helps to pin down the large number of markets where the unbanked and underbanked are most likely to be located. As the FDIC (2014) concludes, the unbanked and underbanked are a significant segment of the U.S. population, while the OIG (2014) concludes that the average underbanked household could save thousands of dollars in interest and fees if they had access to bank accounts designed for low-income customers. For those individuals and families, bank deserts are not a theoretical curiosity, but rather represent a dire need for financial resources that are not currently in place.

Table 1: Summary Statistics for Urban Areas

Variables	Obs	Mean	S.D.	Min	Max
Branch Dummy	5,750	0.942	0.234	0	1
Number of Branches	5,750	7.912	6.647	0	66
% Minority	5,750	0.429	0.234	0	0.991
% Black	5,750	0.156	0.176	0	0.962
% Hispanic	5,750	0.181	0.180	0	0.960
% Poverty (income less than 50% of the poverty line)	5,750	0.089	0.051	0	0.380
Household per capita income ($100,000)	5,750	0.337	0.147	0	1.216
Population density	5,750	28,852	18263	0	178,684

Note: Urban Areas defined by population density of at least 1,000 per square mile.

Table 2: Summary Statistics for Rural Areas

Variables	Obs	Mean	S.D.	Min	Max
Branch Dummy	7,249	0.909	0.286	0	1
Number of Branches	7,249	5.069	4.699	0	37
% Minority	7,249	0.229	0.175	0	0.966
% Black	7,249	0.087	0.117	0	0.830
% Hispanic	7,249	0.093	0.130	0	0.957
% Poverty (income less than 50% of the poverty line)	7,249	0.090	0.037	0	0.321
Household per capita income ($100,000)	7,249	0.284	0.092	0	1.155
Population	7,249	15,775	11988	0	95,302

Note: Rural Areas defined by population density of less than 1,000 per square mile.

Table 3: Characteristics of Bank Deserts in Urban Areas

Variables	Bank Desert	Non- Bank Desert
Number of Observations	351	5,687
Branch Dummy	0.051	0.950
Number of Branches	0.05	8.00
% Minority	0.492	0.415
% Black	0.200	0.151
% Hispanic	0.211	0.173
% Poverty	0.103	0.088
Household per capita Income ($100,000)	0.284	0.341
Population	17,167	28,238

Table 4: Characteristics of Bank Deserts in Rural Areas

Variables	Bank Desert	Non- Bank Desert
Number of Observations	654	6,595
Branch Dummy	0.002	1
Number of Branches	0.002	5.571
% Minority	0.302	0.222
% Black	0.107	0.085
% Hispanic	0.131	0.090
% Poverty	0.089	0.090
Household per capita Income ($100,000)	0.279	0.285
Population	9,384	16,409

Table 5. States with More Than 10 Urban or Rural Bank Deserts

State	Urban Bank Deserts	State	Rural Bank Deserts
California	62	Florida	63
Texas	36	California	48
New York	32	Texas	46
Pennsylvania	21	Georgia	43
Ohio	18	Alabama	38
Florida	17	North Carolina	38
Illinois	13	Pennsylvania	35
New Jersey	13	Arizona	22
Missouri	11	Washington	21
		South Carolina	20
		Tennessee	19
		Virginia	19
		New York	18
		Arkansas	17
		Louisiana	15
		Maryland	11
		Mississippi	11
		New Jersey	11

Table 6. Combined Statistical Areas with at least 8 Urban Bank Deserts

Area	Urban Bank Deserts
New York-Newark, NY-NJ-CT-PA	40
Los Angeles-Long Beach, CA	36
Washington-Baltimore-Arlington, DC-MD-VA-WV-PA	11
Dallas-Fort Worth, TX-OK	11
Philadelphia-Reading-Camden, PA-NJ-DE-MD	10
Pittsburgh-New Castle-Weirton, PA-OH-WV	10
Boston-Worcester-Providence, MA-RI-NH-CT	9
Houston-The Woodlands, TX	9
Omaha-Council Bluffs-Fremont, NE-IA	9
San Jose-San Francisco-Oakland, CA	9
Atlanta-Athens-Clarke County-Sandy Springs, GA	8
Chicago-Naperville, IL-IN-WI	8

Table 7. Logit estimates of bank deserts for urban and rural areas

Variables	Urban areas		Rural areas	
Minority	1.090***		2.953***	
	(0.249)		(0.208)	
Black		0.595*		2.297***
		(0.326)		(0.293)
Hispanic		1.269***		3.071***
		(0.300)		(0.268)
Income	-10.59***	-10.58***	0.871	0.216
	(1.172)	(1.199)	(1.419)	(1.442)
$Income^2$	8.693***	8.700***	-0.913	-0.000222
	(1.155)	(1.163)	(1.675)	(1.662)
Population	-6.47e-05***	-6.46e-05***	-0.000113***	-0.000113***
	(6.99e-06)	(6.94e-06)	(1.02e-05)	(1.03e-05)
Constant	0.494	0.635**	-1.877***	-1.562***
	(0.300)	(0.302)	(0.280)	(0.287)
Observations	5,750	5,750	7,249	7,249
χ^2	297.2***	296.7***	297.8***	256.1***
Pseudo-R^2	0.141	0.141	0.113	0.105

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 8. Logit estimates of bank deserts for urban areas using alternative cut-offs

Variables	Branches/pop<.04		Population at least 4,000	
Minority	1.531***		1.394***	
	(0.220)		(0.266)	
Black		0.953***		0.930***
		(0.287)		(0.332)
Hispanic		1.734***		1.479***
		(0.255)		(0.316)
Income	-11.49***	-11.32***	-10.52***	-10.45***
	(1.084)	(1.105)	(1.401)	(1.440)
$Income^2$	9.442***	9.324***	8.156***	8.118***
	(1.080)	(1.087)	(1.454)	(1.474)
Population	-3.55e-05***	-3.56e-05***	-5.79e-05***	-5.74e-05***
	(4.27e-06)	(4.31e-06)	(7.26e-06)	(7.23e-06)
Constant	0.168	0.330	0.168	0.331
	(0.274)	(0.275)	(0.343)	(0.346)
Observations	5,750	5,750	5,562	5,562
χ^2	370.4***	360.2***	270***	267***
Pseudo-R^2	0.114	0.112	0.134	0.132

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 9. Logit estimates of bank deserts for rural areas using alternative cut-offs

Variables	Branches/pop<.04		Population at least 8,000	
Minority	2.968***		3.134***	
	(0.199)		(0.283)	
Black		2.278***		2.714***
		(0.282)		(0.399)
Hispanic		3.075***		3.076***
		(0.251)		(0.328)
Income	0.477	-0.149	-3.223	-3.609
	(1.390)	(1.420)	(2.310)	(2.293)
$Income^2$	-0.476	0.408	3.332	4.091
	(1.641)	(1.641)	(2.803)	(2.691)
Population	-7.67e-05***	-7.66e-05***	-7.28e-05***	-7.19e-05***
	(7.89e-06)	(7.97e-06)	(1.06e-05)	(1.06e-05)
Constant	-2.107***	-1.794***	-1.897***	-1.649***
	(0.271)	(0.279)	(0.436)	(0.438)
Observations	7,249	7,249	5,036	5,036
χ^2	297.5***	251.7***	171.9***	155.8***
Pseudo-R^2	0.0854	0.0769	0.0907	0.0824

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

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