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Marco Migueis, Michael Suher, and Jessie Xu

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Cost of Banking for LMI and Minority Communities

Marco Migueis,* Michael Suher,† and Jessie Xu‡

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Abstract: We test whether minimum account balances to avoid fees, maintenance fee amounts, and nonsufficient funds charges are systematically different in LMI and majority-minority communities relative to other communities and find that they are generally higher. The minimum account balance to avoid fees on a noninterest checking account is about $45 higher on average in LMI Census tracts than in higher income tracts, and more than $70 higher on average in majority-minority tracts than in majority-white tracts. We investigate potential sources of these differences such as bank business models, competition among providers of financial services, and other demographic characteristics of the tracts. Opportunities for lending income, bank operating costs, and bank size can largely account for the higher cost of retail banking services in LMI and majority-minority communities.

Keywords: Bank fees; deposit accounts; LMI; majority-minority

JEL Classification Numbers: G21, G50, L11, J15, R23, I30

*Federal Reserve Board. Corresponding author: mmigueis@gmail.com.

†Federal Reserve Board.

‡Duke University.

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1 Introduction

Bank accounts facilitate participation in the modern economy and their use is an integral part of a middle-class lifestyle in modern societies; for example, wages in most salaried jobs are typically paid through direct deposit to a bank account. However, the costs associated with deposit accounts can take a toll on low-income bank customers. Account maintenance fees are often charged to customers with low balances, making those with limited savings more susceptible to these fees. Low-income bank customers are also more likely to frequently overdraft their accounts, which can result in hefty fees (Pew Charitable Trusts, 2016).

This paper investigates whether low- and moderate-income (LMI) and majority-minority communities face the double whammy of higher minimum account balances and higher bank account fees. We begin by assessing the relation between bank fees and the income of bank customers by testing whether the fees and minimum account balances charged by banks in LMI Census tracts are higher than those charged by banks in higher income areas. We find that banks in LMI tracts charge higher maintenance fees and require larger balances to avoid those fees. For example, banks in LMI tracts require, on average, a balance about $45 higher to qualify for free checking and otherwise charge a monthly maintenance fee around $0.30 higher, both of which are about 5% higher than the minimums and fees in non-LMI tracts.

We also investigate fees in majority-minority Census tracts (i.e., Census tracts with over 50 percent minority residents). Residents in majority-minority tracts face significantly higher fees and minimum account balances across the various types of bank accounts. The association of LMI tracts with higher fees and minimums decreases after accounting for the majority-minority status of a tract, but retains statistical significance in most cases. Basic checking accounts offered by banks in tracts that are *both* LMI and majority-minority require minimum balance and maintenance fees about 8% higher, on average, than similar accounts in higher income, majority-white tracts.

We consider potential drivers for such differences in bank account fees between LMI communities, majority-minority communities, and other communities, including banks' other sources of revenue, bank costs, competition among banks, and other demographic characteristics of the Cen-

sus tracts. Higher lending income is generally associated with lower fees and minimums. Higher operating costs are generally associated with higher fees and minimums. And large banks generally charge higher fees and require higher minimums. Controlling for these and other factors substantially explains the association between LMI and majority-minority tracts and bank account fees, though some residual unexplained higher fees and minimums remain for majority-minority tracts.

Our results are generally consistent with Adams (2017), who finds that low-income and minority populations generally pay higher bank fees. Unlike Adams (2017), our analysis is fully focused on the cost of banking for LMI and majority-minority populations and we consider several additional indicators of the cost of retail banking services, such as minimum deposit balances to avoid account maintenance fees. Our results are also consistent with the findings of Faber and Friedline (2020) that minimum account balances to avoid fees are substantially higher in majority-minority communities than in majority-white communities.

The rest of this article is divided as follows: Section 2 provides background and discusses the literature on the cost of banking for LMI and minority populations; Section 3 describes our data; Section 4 describes our statistical methodology and presents our empirical results; Section 5 concludes.

2 Background

Bank fee revenues have more than doubled in the past three decades and have grown as a share of banks' total revenues (Pew Charitable Trusts, 2016).[1] According to bank regulatory reports, service charges on deposit accounts were equivalent to 21% of the net income of US banks in 2015, the year of our study. Major fee types include account maintenance fees and overdraft and non-sufficient funds (NSF) fees.

Account maintenance fees have significant impacts on the financial health of low-income and

[1] Previous research papers have argued that high retail banking fees may be, in part, an unintended consequence of legislation (Bernard, 2011; Sarin, 2019). Following the 2008 financial crisis, the Durbin Amendment of the 2010 Dodd-Frank Act required banks to cut fees charged on debit card processing. Banks were estimated to lose $6.6 billion in revenues from this act, which these papers argue caused many banks to introduce new monthly maintenance fees.

minority bank customers. LMI households are estimated to have paid $1.4 billion out of the $2.5 billion U.S. banks earned from checking and savings account maintenance fees in 2021 (Greene et al., 2021). Also, Faber and Friedline (2020) find that checking accounts have higher minimum account balances to avoid fees in majority-minority communities than in majority-white communities ($810 in majority-minority communities vs. $620 in majority-white communities).

U.S. banks with assets over $1 billion collected over $11.45 billion in overdraft and non-sufficient funds (NSF) fees in 2017 (Smith, 2018). Overdraft fees are high – the median overdraft fee was $35 as of 2016 (Pew Charitable Trusts, 2016) – and often not well understood by customers.[2,3] Overdraft and NSF fee revenue is concentrated in a small share of customers.[4] The most frequent overdrafters have low credit scores (sub-600) or lack credit scores completely, carry low account balances, and are more likely to use debit card transactions and ATM services. Overdraft fees hit low-income consumers particularly hard. As of 2014, seven in ten consumers paying over $100 in overdraft fees belonged to households with less than $50,000 in annual income (Pew Charitable Trusts, 2016).

Banked households are defined by the Federal Deposit Insurance Corporation (FDIC) as those that have at least one checking or savings account at a bank or credit union; unbanked households as those that have no bank or credit union account; and underbanked households as those that use both traditional banking services and alternative financial services (AFS), such as payday lending (Federal Deposit Insurance Corporation, 2018).[5] According to a 2017 FDIC survey, 8.4 million US households (6.5%) are "unbanked" and an additional 24.2 million households (18.7%) are "underbanked." The lack of a relationship with a bank often results in low-income households keeping

[2] The federal "opt-in" rule prohibits financial institutions from charging overdraft fees on ATM and one-time debit-card transactions without customer consent (Federal Reserve System, 2009). However, banks often fail to discuss alternatives with frequent overdrafters. Seven in ten overdrafters are not aware that they have the right to overdraft protection on debit cards for free (Pew Charitable Trusts, 2017).

[3] Alan et al. (2018) find that Turkish bank clients were more likely to overdraft when fees are high but not mentioned in the account promotional materials than when fees are low but mentioned in the account promotional materials.

[4] A 2017 study from the Consumer Financial Protection Bureau found that 79% of overdraft and NSF fees are paid by just 9% of account holders (Low et al., 2017). A survey discussed in Stango and Zinman (2009) finds that 68% of respondents paid no overdraft fees, while the 90th percentile of those who had some positive overdraft amount paid $43 per month on average.

[5] AFS is a broad term for a wide range of services, including check-cashing, payday loans, pawn shops, early-access wages, or high-fee prepaid cards.

cash at home (Brobeck, 2020). According to the 2016 Federal Reserve Survey of Consumer Finances, households in the lowest quintile of the income distribution held only $900 in financial assets on average (which is less than the average minimum balance, $971, to have a free non-interest checking account according to 2015 RateWatch data) and only 31% of households in this quintile held a savings or money market deposit account (Brobeck, 2020).

Low-income consumers cite multiple reasons for not using traditional bank accounts including lack of sufficient savings, high fees and minimum balance requirements, and hidden fees levied by banks (Booz-Allen Hamilton and Shugoll Research, 1997; Berry, 2004; Pew Health Group, 2011; Sarin, 2019).[6] Our study aims to (1) compare the bank account fees faced by LMI and minority communities to those faced by higher income and white households and (2) understand the factors that explain any differences.

3 Data

Data on retail banking fees are gathered from a 2015-16 survey by RateWatch. Our dataset includes 81,909 branches, accounting for about 90% of bank branches across the US in 2015. We focus our analysis on the minimum account balances to avoid account maintenance fees and the account maintenance fee amounts for non-interest checking deposit accounts, interest checking deposit accounts, and savings accounts. In addition, we consider the returned check fees due to NSF and the daily maximum NSF charges that can be accrued in a deposit account.

The unit of analysis in the main regressions of our study is the Census tract. To examine the bank fees experienced by the residents of a Census tract, we average the account minimum balances and the fee amounts across the banks with branches within three kilometers of the tract centroid.[7,8]

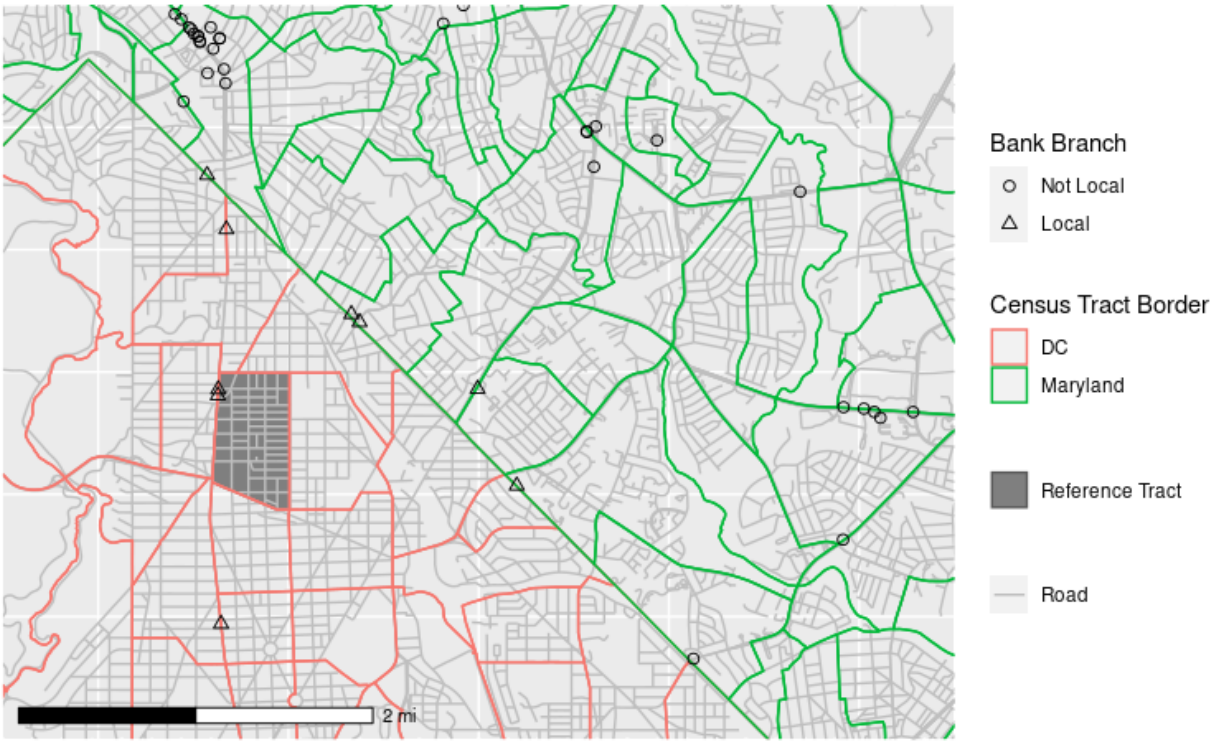
[6] Studies have also found that banks are significantly underrepresented in low-income, urban neighborhoods. Together with high fees, distance to bank branches increases AFS use by households located in low-income areas (Caskey, 1994; Goodstein and Rhine, 2017). AFS providers target their services towards low to middle-income borrowers (Barr, 2004), and low-income consumers see AFS providers as attractive for their ability to provide cash quickly.

[7] In less dense areas where there are no bank branches within three kilometers of a Census tract centroid, the closest branch to the tract centroid is assumed to be the neighborhood's local banking option and its associated menu of fees and account minimums are assigned to the tract. If there is no branch within 15 kilometers of a tract's centroid, the tract is dropped from the sample.

[8] The weight of a bank's fee variables on a tract's average is proportional to the number of branches of the bank in

Figure 1 visualizes this process for an example neighborhood. In this instance, the highlighted reference tract in Washington, DC is linked to the two branches inside its border and seven more branches within a three kilometer radius, all represented by triangles. More distant branches denoted by circles are considered outside this Census tract geographic market.

Figure 1: Defining Neighborhood Bank Branches



Note: Branch locations from FDIC Summary of Deposits. The example shown illustrates how we define the local banking market for a Washington, DC Census tract.

Table 1 presents descriptive statistics for the bank fee variables. We restrict the sample to tracts where all eight fee variables of interest are available. Interest-bearing checking accounts – which pay interest without the withdrawal limitations associated with savings accounts – require, on average, substantially higher account balances to avoid account maintenance fees than non-

the tract.

interest-bearing checking accounts ($7,485 vs. $992). Meanwhile, savings accounts require, on average, the smallest balances to avoid account maintenance fees ($279). The average account maintenance fee amounts line up similarly ($16.2 for interest bearing checking accounts, $7.88 for non-interest-bearing checking accounts, and $4.42 for savings accounts). For perspective, these statistics imply that for the average non-interest checking account, failure to maintain a $992 minimum balance would result in annual maintenance fees of about $95, spelling the erosion of at least 10% of the account's value. Maximum daily NSF fees average $167, and the average fee for a returned check due to NSF is $33.8. Minimum account balances to avoid account maintenance fees and fee amounts are positively correlated across the board.[9]

Table 1: Account Fees and Minimum Balance Requirements by Census Tract

	N	Mean	Std Dev	Minimum	Maximum
No-Interest Checking Minimum	58,246	992	608	0	15,000
Interest Checking Minimum	58,246	7,485	4,259	0	25,000
Savings Minimum	58,246	279	102	0	6,700
No-Interest Checking Fee	58,246	7.88	2.88	0	20
Interest Checking Fee	58,246	16.2	4.77	0	37.5
Savings Fee	58,246	4.42	1.29	0	25
NSF Daily Max	58,246	167	38.0	15	500
NSF Returned Check	58,246	33.8	2.39	10	42.5

Note: Bank fee data from RateWatch survey of U.S. banks from 2015/2016. Data is averaged by Census tract as described at the beginning of section 3. Minimum refers to the account balance required to avoid monthly maintenance fees. NSF stands for non-sufficient funds. NSF Daily Max is the limit on one day's accumulated overdraft fees after which additional overdrafts are denied.

We obtain the main explanatory variables of our study, whether a Census tract is LMI or majority-minority, from the 2015 Federal Financial Institutions Examination Council (FFIEC) Census File.[10] LMI tracts are defined by a median family income below 80% of their metro area median family income. Majority-minority tracts are defined by the minority share of their population being above 50%. In addition, our analysis controls for multiple demographic factors obtained from the

[9] See Table A.1 in the Appendix.
[10] See https://www.ffiec.gov/censusproducts.htm.

American Community Survey (ACS) 2013-2017 five-year sample. Demographic variables include the percentage of the population above 65, the percentage of the population that attained a bachelor's degree, and the percentage of homes occupied by their owners. Tract are classified as urban, suburban, or rural according to the Urbanization Perceptions Small Area Index (UPSAI) produced by the Department of Housing and Urban Development (HUD).[11]

In addition, our analysis includes several controls based on bank data. We obtain lending income, operating costs, and "other charge-offs" for 2015 and total assets as of 2015Q4 from a bank's call report.[12] We obtain the number of branches a bank has in a tract's market area and branch ages from the FDIC Summary of Deposits data. We identify which banks are minority depository institutions (MDI) from the FDIC Minority Depository Institutions list.[13] We construct tract level controls based on these variables as follows: (1) in calculating the operating costs variable for a tract, we first calculate the operating costs of each branch in a tract by dividing their bank's total operating cost by its number of branches; then, we average the operating costs for branches in the tract (this procedure mirrors how we calculate the average fees for a tract); (2) in calculating the lending income and the other changeoffs variables for a tract, we first divide a bank's lending income or other chargeoffs by its total assets; then, we calculate a weighted average of these for banks in a tract, where each bank is weighted in proportion to how many branches it has in the tract; (3) branch network age is the average age of the branches in a tract's market area; (4) big bank share is the proportion of bank branches in a tract that belong to a bank with more than 500 U.S. branches; (5) the MDI variable corresponds to the proportion of bank branches in a tract that belong to a MDI bank; and (6) the Herfindahl-Hirschman Index (HHI) of concentration is calculated as the sum of squared deposit shares of the banks in the tract.[14]

[11] HUD used survey responses in the 2017 American Housing Survey where residents self-identified their tract as urban, suburban, or rural and statistically extrapolated these labels to all tracts using ACS data.

[12] A bank's call report includes comprehensive financial data, such as balance sheet and income statement data. All national and state commercial banks are required to submit this report once per quarter. Other charge-offs correspond to item 5.c of schedule RI-B of the call report. They include charge-offs on extensions of credit to individuals for household, family, and other personal expenses charged-off. In particular, this item includes charge-offs on amounts over-drafted by consumers.

[13] Minority ownership is defined as 51% concentration of ownership among members of a certain minority group. See https://www.fdic.gov/minority-depository-institutions-program/minority-depository-institutions-list.

[14] Branches of the same banks have their deposit shares aggregated. In the limit, if all branches in a tract belong to

Table 2 presents descriptive statistics for the explanatory and control variables used in our analysis.

Table 2: Descriptive Statistics

	N	Mean	Std Dev	Minimum	Maximum
LMI tract	58,246	0.33	0.47	0	1
Maj. Min. tract	58,246	0.33	0.47	0	1
Lending income	58,246	0.024	0.0043	0.0054	0.058
% Owner occupied	58,246	60.5	23.1	0	100
Operating costs	58,246	4,646	2,657	374	38,934
Other chargeoffs	58,246	0.00011	0.00011	0	0.0016
Branch network age	58,246	38.0	8.07	4.53	124
Big bank share	58,246	0.57	0.31	0	1
MDI	58,246	0.012	0.054	0	1
HHI	58,246	41.0	29.9	6.47	100
Rural	58,246	0.12	0.33	0	1
Urban	58,246	0.36	0.48	0	1
% Over 65	58,246	15.1	7.87	0	91
% BA	58,246	31.1	19.6	0	96.4

Note: LMI and majority-minority tracts are from the 2015 FFIEC Census File. Demographic variables are from the ACS 2013-2017 five-year sample. The average operating costs, lending income, and other chargeoffs of a tract are calculated based on bank call reports. Classification of tracts as urban, suburban, or rural comes from HUD's Urbanization Perceptions Small Area Index. Branch age is from the FDIC Summary of Deposits data. Classification as a minority-depository institutions (MDI) from the FDIC Minority Depository Institution list. Variable construction described in section 3.

4 Empirical Analysis

4.1 LMI communities, majority-minority communities, and bank account fees

We begin to explore the costs of banking for LMI communities by testing whether account fees and minimum account balances are systematically different in LMI Census tracts relative to non-

a single bank, the HHI is 100.

LMI Census tracts. Because LMI designations are specific to each metropolitan statistical areas (MSA), we include MSA fixed effects in all specifications.[15]

$$Y_{ic} = \beta_0 + \gamma_c + \beta_1 1(LMI)_{ic} + \varepsilon_{ic}. \tag{1}$$

Here Y is a fee or minimum variable, i is a tract, and c is a metro area. $1(LMI)_{ic}$ is an indicator equal to one if tract i is considered low or moderate income in metro c, and zero if it is middle or upper income. Table 3 presents the results of these regressions.

Table 3: Regression of Fees and Minimums on LMI tracts

	No-Int Check Minimum	Int Check Minimum	Savings Minimum	No-Int Check Fee	Int Check Fee	Savings Fee	NSF Daily Max	NSF Ret Check Fee
LMI tract	45.8***	215***	6.92***	0.31***	0.43***	0.060***	-1.45***	0.13***
	(3.96)	(27.8)	(0.70)	(0.018)	(0.031)	(0.0090)	(0.25)	(0.015)
Observations	58,246	58,246	58,246	58,246	58,246	58,246	58,246	58,246
R-squared	0.324	0.375	0.309	0.441	0.405	0.301	0.345	0.388

Robust standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: All specifications include metro area fixed effects. "Int" means interest. "No-int" means no-interest. NSF means non-sufficient funds. "Ret Check Fee" means returned check fee.

Bank accounts are generally more expensive in LMI communities, both in their maintenance fees and minimum account balances required to avoid those fees. For the most basic accounts, non-interest checking, the minimum balance required to not pay a maintenance fee was, on average, $46 higher in LMI Census tracts than in non-LMI Census tracts, and the maintenance fee was $0.31 higher. Returned check fees are also higher on average in LMI tracts. Meanwhile, banks in LMI tracts set, on average, a smaller daily limit on the accumulation of multiple NSF fees before overdrafts are disallowed than banks in non-LMI tracts.

Following prior research that documented disparities in retail banking for minority customers, we also test whether account fees are systemically different in majority-minority neighborhoods.

[15] Census tracts outside metro areas are grouped together as a single unit in each state.

Table 4 presents the results of these regressions.

Table 4: Regressions of Fees and Minimums on LMI tracts and Majority-minority tracts

	No-Int Check Minimum	Int Check Minimum	Savings Minimum	No-Int Check Fee	Int Check Fee	Savings Fee	NSF Daily Max	NSF Ret Check Fee
LMI tract	45.8***	215***	6.92***	0.31***	0.43***	0.060***	-1.45***	0.13***
	(3.96)	(27.8)	(0.70)	(0.018)	(0.031)	(0.0090)	(0.25)	(0.015)
Maj. Min. tract	71.6***	414***	15.1***	0.49***	0.71***	0.062***	-3.53***	0.15***
	(3.62)	(30.4)	(0.80)	(0.018)	(0.034)	(0.0096)	(0.27)	(0.015)
LMI tract	18.6***	42.3	0.29	0.13***	0.15***	0.043***	0.15	0.079***
	(4.65)	(32.9)	(0.86)	(0.021)	(0.036)	(0.011)	(0.30)	(0.018)
Maj. Min. tract	61.3***	390***	15.0***	0.42***	0.63***	0.038***	-3.61***	0.10***
	(4.32)	(36.1)	(0.99)	(0.022)	(0.040)	(0.011)	(0.32)	(0.018)
Observations	58,246	58,246	58,246	58,246	58,246	58,246	58,246	58,246
R-squared	0.326	0.376	0.312	0.444	0.407	0.301	0.346	0.388

Robust standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: The top rows show the results from univariate regressions. All specifications include metro area fixed effects. "Int" means interest. "No-int" means no-interest. NSF means non-sufficient funds. "Ret Check Fee" means returned check fee.

The results in the second row display the average differences in the cost of retail banking in majority-minority Census tracts relative to other tracts. Majority-minority tracts experience higher minimums and fees across all account types. For no-interest checking accounts, minimum balances to avoid fees are on average $72 higher and account maintenance fees are $0.49 higher. These results are consistent with the findings of Faber and Friedline (2020), who, using a different bank survey, also find that banks in minority neighborhoods required higher minimum balances to avoid account maintenance fees.

The lower panel of Table 4 presents results when indicators for whether tracts are LMI or majority-minority are included simultaneously in the regressions. Coefficients on both indicators decrease relative to the univariate regressions, which is expected given that they have a correlation of about 0.5. For example, the coefficient on the LMI tract indicator for the regression of the minimum account balance required to avoid a maintenance fee on a no-interest checking account

goes down from $46 to $19. Still, the coefficients associated with LMI tracts remain positive and statistically significant in most regressions. The coefficients on the majority-minority indicators are positive (with the exception of the daily limit on NSF fees) and of larger magnitude than the coefficients on the LMI indicators. This suggests that the factors underpinning higher bank fees are stronger in majority-minority Census tracts than in LMI tracts. Importantly, these differences add up for tracts that are both LMI and majority-minority. Banks in neighborhoods that are both LMI and majority-minority require, on average, a $80 higher minimum account balance to avoid maintenance fees on no-interest checking accounts than banks in tracts that are both higher income and majority-white.

4.2 Explanations for higher bank fees in LMI and majority-minority communities

To better understand the differences in the cost of banking services for LMI and majority-minority Census tracts, we study the impact of several potential drivers of these differences, including banks' other sources of revenue, bank costs, other bank characteristics, competition among banks, and other demographic characteristics of the tracts. Table 5 displays the correlation between the various additional variables we consider and the indicator variables for LMI and majority-minority tracts.

A bank's ability to earn revenue from sources besides retail fees may influence how high a bank sets those fees. For example, a bank more focused on earning lending income may set lower fees in its deposit accounts to attract customers to whom it can sell other products. Per Table 5, the lending income of banks in a tract is somewhat negatively correlated with whether a tract is LMI or majority-minority; therefore, the lower lending income of banks in LMI and majority-minority tracts may partly explain the difference in account fees in these tracts. As another proxy for prospective lending income, we also include the home ownership rate in a tract in our regressions. More owner-occupied housing in an area likely increases a bank's ability to earn income from products such as mortgages, instead of fees on its deposit accounts. Like lending income, the

Table 5: Correlation Among Explanatory Variables

	LMI	Maj-Minority
LMI tract	1.00	0.47
Maj. Min. tract	0.47	1.00
Lending income	-0.07	-0.19
% Owner occupied	-0.56	-0.43
Operating costs	0.08	0.31
Other chargeoffs	0.02	-0.03
Branch network age	0.05	0.03
Big bank share	0.07	0.19
MDI	0.08	0.22
HHI	-0.10	-0.11
Rural	-0.15	-0.20
Urban	0.43	0.39
% Over 65	-0.26	-0.32
% BA	-0.44	-0.35

owner-occupied housing rate in a Census tract is negatively correlated with whether a tract is LMI or majority-minority.

Bank operating costs are also a plausible driver of fee levels, as banks with higher costs likely charge their customers higher fees to recoup costs. Operating costs are positively correlated with whether a tract is LMI or majority-minority. Similarly, banks with high charge-offs on overdrafts of deposit accounts may choose to charge higher fees to compensate for these costs. To account for this possible effect, we include in our analysis the "other charge-offs" item from bank call reports, which includes charge-offs due to unpaid overdrafts of deposit accounts.[16]

Certain other characteristics, such as age, size, or ownership, may also affect a bank's retail fees. Age may affect a bank's fees if, for example, older banks have a customer base who will remain loyal despite higher fees. On the flip side, newer banks may use lower fees or no-minimum checking accounts to entice new customers. To test this potential effect, we include the average age of the branches in a given tract in our regressions. Size may also plausibly affect bank fees, due to economies of scale (which may make fees lower), market power (which may make fees higher), or the convenience of more ubiquitous branches (which may make fees higher). The proportion of large banks in a Census tract correlates positively with whether a tract is LMI or majority-minority.[17] Large banks own 48% of branches in the average tract, but own 55% of branches in the average LMI tract and 61% of branches in the average majority-minority tract. In addition, we explore whether bank ownership by minority individuals influences bank fees. Banks with minority ownership may be able to charge higher fees due to having a more loyal customer base. Minority ownership is positively correlated with LMI and majority minority tracts.

Standard economic theory holds that, all else equal, more competition should be associated with lower prices for consumers of goods and services. We account for competition in our analysis by introducing the HHI of a tract in our regressions. The HHI is mildly negatively correlated with the tract being LMI or majority-minority, implying a more competitive banking landscape in those

[16] The use of "other charge-offs" as a control variable for bank business model follows Melzer and Morgan (2015). They found that losses on overdrafts are higher when credit unions must compete with payday lenders in the market for small consumer loans, implying that credit unions respond to competition by increasing risk-taking.

[17] We define a bank as large if it has a branch network with at least 500 locations.

tracts on average.

The density of a location may also affect bank fees, at least partly due to its effect on bank operating costs. Thus, we include dummy variables for whether a tract is rural or urban (suburban is the excluded category). Urban tracts are more likely to be LMI and majority-minority, while rural tracts are less likely to be LMI or majority-minority.

Certain other demographic characteristic of tracts may also influence bank fees. In particular, the share of seniors or of individuals with a bachelor's degree may plausibly affect bank fees. One possible mechanism is financial literacy. Research has shown that senior individuals and individuals with less schooling score lower in financial literacy tests (Bumcrot and Lusardi, 2013).[18] Lower financial literacy may mean that individuals are less aware of sometimes opaque fee and minimum structures, or of the availability of lower cost options at other branches or online. On average, LMI tracts and majority-minority tracts have a smaller proportion of senior individuals and college educated individuals than other tracts.

Table 6 presents the results of these regressions. To facilitate comparisons of effects in our regression analysis, we standardized the following control variables to their z-score: lending income, % owner occupied, operating costs, other charge-offs, bank age, big bank share, MDI share, HHI, % over 65, and % college bachelors. Z-scores for tract-level measures are calculated by subtracting the average for the variable across all tracts and then dividing by the standard deviation across all tracts. Bank-level variables are first winsorized at the 1st and 99th percentiles to reduce the impact of any outlier values, and then averaged across banks operating in each tract as described above. Z-scores for these variables are then computed similarly across the tract distribution.[19]

Some of the control variables we consider have regression coefficients in line with our predictions. Higher lending income is generally associated with lower fees and minimums. Higher operating costs are generally associated with higher fees and minimums. Bank age is generally associated with higher minimums and fees. Banks charge lower fees and require lower minimum

[18] Williams (2016) finds that median age is negatively associated with bank overdraft fees, and that the effect of education on fees is not statistically significant.

[19] The distribution of bank-level variables pre-winsorization are in Table A.2 and the summary statistics of the tract level variables post Z-scoring are in Table A.3 in the Appendix.

Table 6: Regressions of Fees and Minimums on LMI tracts, Majority-minority tracts, and Other Controls

	No-Int Check Minimum	Int Check Minimum	Savings Minimum	No-Int Check Fee	Int Check Fee	Savings Fee	NSF Daily Max	NSF Ret Check Fee
LMI tract	18.6***	42.3	0.29	0.13***	0.15***	0.043***	0.15	0.079***
	(4.65)	(32.9)	(0.86)	(0.021)	(0.036)	(0.011)	(0.30)	(0.018)
Maj. Min. tract	61.3***	390***	15.0***	0.42***	0.63***	0.038***	-3.61***	0.10***
	(4.32)	(36.1)	(0.99)	(0.022)	(0.040)	(0.011)	(0.32)	(0.018)
LMI tract	1.42	-17.0	-1.89*	0.085***	0.14***	0.030**	0.55	0.083***
	(5.49)	(38.3)	(0.99)	(0.022)	(0.040)	(0.014)	(0.35)	(0.021)
Maj. Min. tract	10.1**	20.9	7.17***	0.054**	0.19***	0.016	-1.34***	-0.061***
	(4.80)	(38.8)	(1.15)	(0.021)	(0.041)	(0.013)	(0.34)	(0.020)
Lending income	-33.3***	-457***	-0.66	-0.73***	-0.97***	-0.00023	7.72***	-0.10***
	(4.51)	(25.3)	(0.68)	(0.019)	(0.031)	(0.013)	(0.30)	(0.021)
% Owner occupied	-3.57*	-5.13	-3.14***	0.027***	0.0043	-0.0074	-0.50***	0.040***
	(2.11)	(16.0)	(0.45)	(0.0094)	(0.018)	(0.0055)	(0.15)	(0.0090)
Operating costs	101***	839***	2.50***	0.78***	0.75***	-0.033***	-10.8***	0.045***
	(3.32)	(28.1)	(0.66)	(0.015)	(0.033)	(0.0092)	(0.28)	(0.014)
Other chargeoffs	-16.6***	21.9	4.73***	-0.027**	-0.32***	0.035***	6.29***	-0.55***
	(3.31)	(25.9)	(0.69)	(0.012)	(0.022)	(0.0075)	(0.39)	(0.021)
Branch network age	36.3***	-31.8	-1.25**	-0.16***	0.081***	-0.0081	1.19***	0.17***
	(4.24)	(23.5)	(0.53)	(0.015)	(0.027)	(0.0092)	(0.28)	(0.019)
Big bank share	72.0***	959***	32.5***	0.63***	1.01***	0.27***	5.62***	0.43***
	(5.37)	(33.3)	(0.68)	(0.020)	(0.034)	(0.013)	(0.32)	(0.021)
MDI	22.3***	79.9***	15.1***	0.18***	0.29***	-0.023***	-0.31**	0.22***
	(1.93)	(15.3)	(0.64)	(0.012)	(0.015)	(0.0082)	(0.14)	(0.011)
HHI	-16.0***	-154***	-8.65***	-0.19***	-0.32***	-0.077***	-0.50**	-0.041***
	(3.43)	(23.2)	(0.47)	(0.013)	(0.024)	(0.0078)	(0.21)	(0.012)
Rural	-20.7*	-183**	-3.95**	-0.24***	-0.19**	-0.016	-0.71	-0.27***
	(12.4)	(77.7)	(1.79)	(0.044)	(0.080)	(0.026)	(0.71)	(0.044)
Urban	-0.40	-98.4***	0.99	-0.052***	-0.13***	0.021**	0.98***	0.027*
	(4.13)	(28.4)	(0.87)	(0.017)	(0.030)	(0.010)	(0.27)	(0.016)
% Over 65	-5.16***	9.90	2.73***	-0.023***	-0.013	0.0093*	0.23*	-0.018**
	(1.91)	(16.0)	(0.32)	(0.0088)	(0.016)	(0.0048)	(0.13)	(0.0078)
% BA	-2.60	-4.01	4.51***	0.0040	0.093***	0.025***	1.65***	0.025***
	(2.26)	(16.8)	(0.42)	(0.0098)	(0.018)	(0.0057)	(0.15)	(0.0091)
Observations	58,246	58,246	58,246	58,246	58,246	58,246	58,246	58,246
R-squared	0.371	0.467	0.395	0.615	0.526	0.328	0.419	0.460

Robust standard errors in parentheses
$^{*}\ p < 0.1$, $^{**}\ p < 0.05$, $^{***}\ p < 0.01$

Note: The top panel reprints the results when no controls are included from Table 4 for ease of comparison. The variables lending income, % owner occupied, operating costs, other chargeoffs, branch network age, big bank share, MDI, HHI, % over 65, and % BA enter as z-scores, meaning those coefficients capture a difference of one standard deviation in that variable across the distribution over all Census tracts. The variables lending income, operating costs, other chargeoffs, and branch network age were also winsorized at the 1st and 99th percentiles before their z-scores are calculated. All specifications include metro area fixed effects.

balances in rural areas. Bank ownership by minority individuals is generally associated with higher fees. And we find a strong positive relationship between fees and the presence of large banks.

Certain control variables have effects that we did not expect. In our regressions, less competition across banks (measured by a higher HHI index) is associated with lower fees. This unintuitive relation may result from the number of banks in a Census tract being correlated with an unidentified variable that influences fees. Also, we find that a higher proportion of individuals with bachelor's degree is associated with higher fees. Other control variables had inconsistent or not statistically significant effects on bank minimum account balances and fees.

Most of the difference in minimum account balances and fees between LMI Census tracts, majority-minority Census tracts, and other Census tracts are accounted for by the economic factors we included in these regressions. In several cases, the inclusion of control variables eliminated the statistical significance of the LMI or majority-minority coefficients. These regression results suggest that standard economic explanations largely explain the systematically higher fees observed in LMI and majority-minority Census tracts. Still, some differences remain unexplained. For example, the LMI tract variable continues to be associated with approximately a $0.09 higher monthly maintenance fee for a no-interest checking account that cannot be accounted for by observable differences.

4.3 Bank-level analysis

Given that most fee and minimum decisions are made at the bank level rather than the branch level, we turn to analogous regressions where the unit of observation is the bank instead of the Census tract. This alternative setup provides a more direct lens into bank decision-making, as opposed to the focus on the impact on communities that is achieved through the Census tract level regressions.

Under this approach, bank fee and minimum account balance variables generally require no averaging, as most banks (95%) report the same fee and minimum account balances across their various branches. The few banks for which some differences were reported tend to be large banks.

In those cases, we average fee and minimum values across the bank's branch network with every link between a branch and a tract contributing equally. Other bank variables, such as lending income, branch network age, and "big bank," are also directly used for each bank. To construct the demographic variables used in these regressions, we take averages of the Census variables across all tracts deemed within a given bank's branch network (where whether a bank is in a Census tract is determined as described in section 3). The mean LMI tract concentration is 26% with a standard deviation of 19%, and the mean majority-minority tract concentration is 16% with a standard deviation of 22%.[20]

In assessing whether banks concentrated in LMI communities or in majority-minority communities set higher minimum account balances to avoid fees or higher fee amounts, we estimate two regression specifications: a first one where the extent to which a bank's branches are located in LMI or majority-minority neighborhoods are the only explanatory variables, and a second one where the various control variables previously discussed for the Census-tract level regressions are also included. All explanatory variables, with the exception of the big bank and minority ownership indicators, enter as Z-scores. This means the coefficients capture a difference of one standard deviation in that variable across the distribution over all banks and that the constant gives the average of the dependent variables for a bank with the mean value of each variable and zeroes for the indicator variables. Note that the lending income, operating costs, other chargeoffs, and branch network age control variables are also winsorized at 1st the 99th percentiles to reduce the impact of any outliers in our analysis. Table 7 presents the results of these regressions.

Banks more concentrated in LMI tracts require higher minimum balances to avoid maintenance fees on their interest-checking accounts, have higher NSF daily maximum accruals, and charge higher returned check fees. We find no statistically significant relation between a bank's concentration in LMI tracts and other fee variables. Banks more concentrated in majority-minority tracts require higher account balances to avoid fees and charge higher fees across most categories considered. For example, the minimum account balance to avoid a maintenance fee on a savings account

[20] Summary statistics for the bank-level explanatory variables are in Table A.4, in Table A.5 post Z-scoring, and their correlation with LMI and majority-minority tract bank footprints in Table A.6 in the Appendix.

Table 7: Regressions of Fees and Minimums on LMI tracts, Majority-minority tracts, and Other Controls - Bank level

	No-Int Check Minimum	Int Check Minimum	Savings Minimum	No-Int Check Fee	Int Check Fee	Savings Fee	NSF Daily Max	NSF Ret Check Fee
LMI tract	52.1	272**	4.01	0.12	0.13	-0.12	5.20**	0.68***
	(33.9)	(123)	(4.22)	(0.13)	(0.17)	(0.098)	(2.28)	(0.21)
Maj. Min. tract	42.2	244*	39.5***	1.18***	1.05***	0.50***	5.96***	0.95***
	(27.8)	(125)	(5.85)	(0.15)	(0.20)	(0.11)	(2.04)	(0.18)
LMI tract	-30.8	142	-2.70	-0.11	-0.077	-0.30***	1.55	0.26
	(36.7)	(107)	(4.75)	(0.17)	(0.19)	(0.11)	(2.56)	(0.21)
Maj. Min. tract	-12.0	46.3	25.9***	0.92***	0.67***	0.36***	1.25	0.48**
	(39.1)	(142)	(6.26)	(0.17)	(0.22)	(0.12)	(2.33)	(0.19)
Lending income	-85.7*	-144	-7.50	-0.20	-0.21	-0.021	1.54	-0.49***
	(45.4)	(111)	(5.55)	(0.14)	(0.17)	(0.11)	(2.20)	(0.18)
% Owner occupied	-96.7*	58.0	-14.6	-0.34	0.23	0.13	-6.16*	-0.36
	(58.3)	(191)	(13.0)	(0.24)	(0.33)	(0.17)	(3.30)	(0.29)
Operating costs	23.5	255	12.0***	0.30**	0.44***	0.022	-1.65	-0.098
	(27.6)	(159)	(4.52)	(0.13)	(0.15)	(0.091)	(1.97)	(0.12)
Other chargeoffs	-41.2*	58.8	-1.57	-0.098	-0.16	-0.074	0.52	-0.39*
	(21.4)	(120)	(4.94)	(0.11)	(0.14)	(0.079)	(2.09)	(0.23)
Branch network age	-42.9	15.7	-11.6**	-0.26*	-0.076	-0.35***	-7.60***	-0.48**
	(35.6)	(118)	(4.84)	(0.14)	(0.19)	(0.13)	(2.41)	(0.19)
Big bank	339**	4,424***	130***	3.43***	5.53***	0.94	9.00	1.01
	(153)	(1,548)	(33.6)	(0.83)	(1.71)	(0.68)	(15.2)	(1.03)
MDI	55.6	-1,389***	86.0	1.77	0.057	-1.28**	31.8**	1.90**
	(154)	(451)	(63.6)	(1.29)	(1.04)	(0.56)	(16.2)	(0.83)
HHI	-1.46	101	1.29	0.22	0.12	-0.25*	-0.87	0.12
	(38.4)	(185)	(7.17)	(0.20)	(0.28)	(0.15)	(3.49)	(0.31)
Rural	10.0	-89.7	-4.39	0.52***	-0.28	0.24	0.75	-0.84***
	(40.0)	(187)	(6.78)	(0.20)	(0.25)	(0.20)	(3.73)	(0.32)
Urban	52.4	294*	-5.02	0.36*	0.52**	0.36*	0.50	0.30
	(59.0)	(162)	(12.6)	(0.21)	(0.26)	(0.18)	(3.12)	(0.26)
% Over 65	-22.7	23.4	3.44	-0.093	0.043	-0.086	0.70	0.38**
	(26.9)	(118)	(6.87)	(0.16)	(0.18)	(0.11)	(2.50)	(0.19)
% BA	-109**	343**	5.05	-0.0018	0.47**	0.11	3.45	0.30
	(54.8)	(165)	(6.32)	(0.18)	(0.23)	(0.13)	(2.50)	(0.25)
Constant	402***	2,108***	140***	3.15***	9.30***	3.38***	159***	30.5***
	(37.1)	(128)	(5.54)	(0.13)	(0.17)	(0.10)	(1.94)	(0.16)
Observations	776	776	776	776	776	776	776	776
R-squared	0.030	0.095	0.128	0.156	0.139	0.070	0.078	0.180

Robust standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: The top panel shows results when no controls are included. In the bottom panel, all explanatory variables except the indicators for big bank and MDI enter as z-scores. The lending income, operating costs, other chargeoffs, and branch network age variables are also winsorized at the 1st and 99th percentiles before their z-scores are calculated.

is, on average, $40 higher for a bank one standard deviation more concentrated in majority-minority tracts.

The higher minimum account balances and fees observed at banks that are concentrated in LMI or majority-minority Census tracts are somewhat accounted for by the economic factors we included in these regressions. Once the control variables are added to the regressions, the coefficients associated with banks being located in LMI tracts generally decrease and their statistical significance disappears. Meanwhile, the coefficients associated with banks' concentration in majority-minority tracts also decrease across all regressions, but retain statistical significance in most cases. For example, the minimum account balance to avoid a maintenance fee on a savings account still remains, on average, $26 higher for a bank that is one standard deviation more concentrated in majority-minority tracts. These results raise the possibility that additional factors not included in these regressions drive these differences.

5 Discussion

Our analysis finds substantial evidence that bank customers in LMI communities and majority-minority communities face higher fees and must maintain higher account balances to avoid maintenance fees in their deposit accounts. These differences in fees are compounded for communities that are both LMI and majority-minority. Banks' higher fees and minimums in LMI and majority-minority communities are largely explained by economic factors such as banks' alternative sources of income (such as interest income) and operating costs. Still, these higher banking costs are likely to compound the economic disadvantages faced by LMI and majority-minority communities.

Reducing cost inequalities in access to financial services would likely increase the standard of living for LMI and majority-minority communities and reduce economic inequality.[21] But because most of the disparity in the cost of retail banking is driven by economic factors, reducing the disad-

[21] See Beck et al. (2009) and Mookerjee and Kalipioni (2010) for discussions of the relation between access to financial services and income inequality. In a study specifically about access to bank accounts, Prina (2015) finds that free access to savings accounts increased financial well-being of Nepalese women.

vantage faced by LMI and majority-minority communities likely requires creative policy solutions. Direct regulation of fees could be considered, but recent research suggests such regulation may have unintended consequences. For example, Dlugosz et al. (2021) find that the unbanked population decreased in states where federal regulation preempted state-based regulations that limited bank fees. Still, other policy options could be considered. Armstrong and Vickers (2012) and Sarin (2019) suggest that regulators could enhance welfare by making fees more salient; Sarin (2019) also adds that the cross-subsidization of products (e.g., low-income bank clients often cross-subsidize products for high-income bank clients) could be regulated. Initiatives such as FDIC's Model Safe Accounts Pilot have also showed possible approaches to offer low-cost banking services for unbanked, low-income individuals.

Future research should aim to confirm the findings of this paper using a longer sample period. Also, other potential drivers of higher bank fees, such as bank size, likely merit additional investigation.

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Appendix

A Additional tables and figures

Table A.1: Correlation Among Account Fees and Minimum Balance Requirements

	No-Int Check Minimum	Int Check Minimum	Savings Minimum	No-Int Check Fee	Int Check Fee	Savings Fee	NSF Daily Max	NSF Ret Check Fee
No-Int Check Minimum	1.00							
Int Check Minimum	0.50	1.00						
Savings Minimum	0.30	0.35	1.00					
No-Int Check Fee	0.56	0.60	0.43	1.00				
Int Check Fee	0.43	0.75	0.41	0.73	1.00			
Savings Fee	0.17	0.20	0.42	0.28	0.30	1.00		
NSF Daily Max	-0.04	-0.03	0.03	-0.19	-0.13	0.03	1.00	
Ret Check Fee	0.14	0.08	0.21	0.29	0.28	0.27	0.05	1.00

Table A.2: Bank characteristic summary statistics

	N	Mean	Std Dev	Minimum	p1	p99	Maximum
Operating costs	6,090	10,844	192,467	-89	345	39,015	7,401,172
Lending income	6,090	0.032	0.013	0	0.0028	0.058	0.45
Other chargeoffs	6,090	0.000094	0.00075	0	0	0.0016	0.035
Branch network age	6,090	46.5	33.2	0	4.53	131	223

Note: These statistics are prior to winsorization at the 1st and 99th percentiles.

Table A.3: Tract level regression sample summary statistics with Z-scores

	N	Mean	Std Dev	Minimum	Maximum
LMI tract	58,246	0.33	0.47	0	1
Maj. Min. tract	58,246	0.33	0.47	0	1
Rural	58,246	0.12	0.33	0	1
Urban	58,246	0.36	0.48	0	1
Lending income	58,246	0	1.00	-4.34	7.80
% Owner occupied	58,246	0	1.00	-2.61	1.71
Operating costs	58,246	0	1.00	-1.61	12.9
Other chargeoffs	58,246	0	1.00	-0.97	13.3
Branch network age	58,246	0	1.00	-4.15	10.7
Big bank share	58,246	0	1.00	-1.84	1.41
MDI	58,246	0	1.00	-0.22	18.3
HHI	58,246	0	1.00	-1.15	1.97
% Over 65	58,246	0	1.00	-1.92	9.64
% BA	58,246	0	1.00	-1.59	3.33

Note: These statistics reflect the sample used for the results in Table 6 including z-scoring of non-indicator variables.

Table A.4: Bank level summary statistics

	N	Mean	Std Dev	Minimum	Maximum
LMI tract	776	0.26	0.19	0	1
Maj. Min. tract	776	0.16	0.22	0	1
Lending income	776	0.032	0.0078	0.0054	0.058
% Owner occupied	776	61.6	11.0	26.5	91.6
Operating costs	776	2,083	2,081	374	38,934
Other chargeoffs	776	0.000083	0.00021	0	0.0016
Branch network age	776	37.2	22.9	4.53	131
Big Bank	776	0.026	0.16	0	1
MDI	776	0.012	0.11	0	1
HHI	776	40.4	18.2	9.73	100
Rural	776	0.23	0.29	0	1
Urban	776	0.31	0.24	0	1
% Over 65	776	15.9	3.15	7.65	31.8
% BA	776	29.6	11.6	6.20	79.0

Table A.5: Bank level regression sample summary statistics with Z-scores

	N	Mean	Std Dev	Minimum	Maximum
LMI tract	776	0	1.00	-1.36	3.86
Maj. Min. tract	776	0	1.00	-0.76	3.89
Lending income	776	0	1.00	-3.38	3.38
% Owner occupied	776	0	1.00	-3.19	2.73
Operating costs	776	0	1.00	-0.82	17.7
Other chargeoffs	776	0	1.00	-0.40	7.24
Branch network age	776	0	1.00	-1.42	4.09
Big bank	776	0.026	0.16	0	1
MDI	776	0.012	0.11	0	1
HHI	776	0	1.00	-1.68	3.27
Rural	776	0	1.00	-0.81	2.65
Urban	776	0	1.00	-1.27	2.84
% Over 65	776	0	1.00	-2.62	5.03
% BA	776	0	1.00	-2.02	4.26

Note: These statistics reflect the sample used for the results in Table 7 including z-scoring of non-indicator variables.

Table A.6: Bank level - Correlation Among Explanatory Variables

	LMI	Maj-Minority
LMI tract	1.00	0.35
Maj. Min. tract	0.35	1.00
Lending income	-0.03	-0.05
% Owner occupied	-0.55	-0.42
Operating costs	0.09	0.16
Other chargeoffs	0.04	0.11
Branch network age	-0.18	-0.26
Big bank	0.09	0.16
MDI	0.11	0.34
HHI	-0.32	-0.30
Rural	-0.31	-0.36
Urban	0.55	0.44
% Over 65	-0.32	-0.36
% BA	0.02	0.10