Mobile Banking, Bank Branch Closures, and Self-Employment in the United States

Alina Malkova*

February 2025

Preliminary Draft — Please Do Not Cite

Abstract

This paper investigates whether mobile banking can substitute for traditional branch banking in supporting self-employment. Using data from the FDIC National Survey of Unbanked and Underbanked Households (2013–2023), I document that self-employment rates are significantly higher among branch banking users (9.95%) compared to mobile-only users (7.19%). I develop a structural model of joint banking mode and employment choice estimated via the Arcidiacono-Miller CCP approach. The structural estimates reveal that mobile banking provides substantially weaker credit access for entrepreneurship than branch banking: the broadband-mobile-SE interaction coefficient (-0.247) is more than twice as negative as the branch coefficient (-0.113). Counterfactual simulations show that a 50% reduction in branch access reduces aggregate self-employment by 7.9%, while a 25% increase in mobile banking adoption raises self-employment by only 1.1%. Even combining branch closures with universal broadband expansion results in a net decline in self-employment. These findings suggest that policies promoting mobile banking and broadband infrastructure cannot

*Florida Institute of Technology. Email: amalkova@fit.edu

fully offset the negative effects of branch closures on entrepreneurship, particularly in underserved communities.

JEL Codes: G21, J24, L26, O33, R12

Keywords: Mobile banking, self-employment, entrepreneurship, bank branches, financial inclusion, banking deserts

1 Introduction

The landscape of retail banking in the United States has undergone a dramatic transformation over the past decade. Between 2019 and 2023, U.S. bank branches declined by 5.6%, with over 4,000 branch closures nationwide (FDIC, 2023). Simultaneously, mobile banking adoption has surged: the share of banked households reporting mobile banking as their primary account access method rose from 15.1% in 2017 to 43.5% in 2021 (FDIC, 2021). These trends have left approximately 12.3 million Americans living in "banking deserts"—communities lacking physical bank branches within reasonable distance.

This paper investigates a critical question at the intersection of financial access and entrepreneurship: Does mobile banking serve as a substitute channel for credit access that supports self-employment in areas with declining branch presence? Self-employment represents a vital pathway to economic mobility, particularly for populations historically underserved by traditional financial institutions. If mobile banking can effectively replace branch-based banking relationships for entrepreneurial credit access, the ongoing digitization of financial services may partially offset the negative effects of branch closures on local economic dynamism. Conversely, if branch relationships remain essential for accessing the credit and financial services that enable entrepreneurship, the geographic concentration of branch closures in lower-income and minority communities may exacerbate existing disparities in entrepreneurship rates.

I study this question using microdata from the FDIC National Survey of Unbanked and Underbanked Households, which is administered biennially as a supplement to the Current Population Survey. The survey provides detailed information on banking behaviors, including the specific channels households use to access their accounts, combined with employment status from the CPS base survey. Importantly, the CPS identifies self-employment through its class-of-worker variable, allowing me to distinguish between wage employment and entrepreneurship.

The empirical analysis proceeds in two stages. First, I document descriptive patterns and

estimate reduced-form relationships between mobile banking adoption and self-employment. The raw data reveal a striking pattern: households that primarily use branch banking have a self-employment rate of 12.6%, compared to just 8.7% among mobile-only banking users. However, this correlation likely reflects selection—the same characteristics that lead individuals to prefer branch banking (older age, higher wealth, established business relationships) may also be associated with higher rates of self-employment. After controlling for demographics, education, income, and CBSA fixed effects, the relationship between mobile banking and self-employment becomes small and statistically insignificant. Instrumental variable estimates using local broadband penetration as an instrument for mobile banking adoption yield positive but imprecise effects.

Second, I develop a structural model of joint banking mode and employment status choice. Individuals choose from three banking modes (unbanked, mobile/online only, branch user) and three employment statuses (wage employment, self-employment, not working), yielding nine discrete choice alternatives. The key structural parameters capture how banking mode affects access to credit, and how credit access in turn affects the returns to self-employment. This framework allows me to decompose the observed correlation between branch banking and self-employment into (i) selection effects (who chooses each banking mode), (ii) direct effects (how banking mode affects employment outcomes), and (iii) the role of local banking infrastructure in shaping both choices.

The structural model enables counterfactual policy analysis that reduced-form methods cannot provide. Specifically, I can simulate the effects of: (1) continued branch closures with no change in mobile banking access; (2) branch closures accompanied by improvements in broadband infrastructure that facilitate mobile banking adoption; and (3) targeted subsidies for mobile banking adoption in banking deserts.

This paper contributes to several literatures. First, it adds to the growing body of work on the real effects of bank branch closures (Nguyen, 2019; Granja et al., 2022; Celerier and Matray, 2019). While existing research has documented effects on small business lending

and local economic activity, I provide the first evidence specifically on self-employment entry. Second, the paper contributes to the literature on technology and financial inclusion (Jack and Suri, 2014; Muralidharan et al., 2016; Breza et al., 2020), extending the analysis from developing country contexts to examine whether mobile technology can substitute for physical banking infrastructure in advanced economies. Third, I contribute methodologically by developing a structural framework for analyzing the joint determination of banking mode and employment status, which can be applied to study other aspects of financial access and labor market outcomes.

2 Background and Institutional Context

2.1 Bank Branch Closures in the United States

The consolidation of the U.S. banking sector has accelerated in recent years. Following the 2008 financial crisis, regulatory changes increased compliance costs for small banks, spurring mergers and branch network optimization. More recently, the COVID-19 pandemic accelerated the shift toward digital banking, leading banks to close branches deemed redundant.

Branch closures have not been geographically uniform. Rural areas, low-income urban neighborhoods, and communities with higher shares of minority residents have experienced disproportionate declines in branch presence (Morgan et al., 2016; Ergungor, 2010). This pattern raises concerns about equitable access to financial services, as branch relationships remain important for accessing certain products—particularly small business credit that relies on soft information and relationship lending (Petersen and Rajan, 2002; Berger et al., 2005).

2.2 Mobile Banking Adoption

Mobile banking technology has evolved rapidly from simple balance checking to comprehensive financial management platforms. Modern mobile banking applications allow users

to deposit checks, transfer funds, apply for loans, and manage investments. The Federal Reserve's survey of household financial technology use documents steady increases in mobile banking adoption across all demographic groups, though significant disparities remain by age, income, and education (Federal Reserve, 2022).

For entrepreneurs and self-employed individuals, mobile banking offers potential benefits including: reduced transaction costs for managing business finances, faster access to account information for cash flow management, and the ability to conduct banking outside traditional business hours. However, mobile banking may be less effective than branch relationships for establishing the trust and soft information transmission that facilitate access to credit.

2.3 Self-Employment and Credit Access

Self-employment requires access to capital for startup costs, working capital, and investment in growth. Traditional bank lending to small businesses relies heavily on relationship banking, where loan officers develop knowledge about borrowers through repeated interactions (Berger and Udell, 1995). This model inherently favors borrowers with physical access to branches.

Recent research has examined alternative financing channels for entrepreneurs, including online lending platforms (Morse, 2015; Tang, 2019), fintech credit scoring (Berg et al., 2020; Fuster et al., 2019), and mobile money in developing countries (Beck et al., 2018). However, evidence on whether mobile banking—as distinct from mobile lending—affects entrepreneurship in advanced economies remains limited.

3 Data

3.1 FDIC National Survey of Unbanked and Underbanked Households

The primary data source is the FDIC National Survey of Unbanked and Underbanked Households, conducted biennially since 2009 as a supplement to the June Current Population Survey. The survey collects detailed information on household banking status, account types, methods of accessing accounts, and use of alternative financial services.

For this analysis, I use the multi-year public use microdata file covering survey waves from 2009 to 2023, yielding approximately 570,000 household-level observations. The survey includes harmonized variables across waves, enabling consistent measurement of banking behaviors over time. Key variables from the FDIC supplement include:

- **Banking status:** Whether the household has a bank account (checking, savings, or both), and detailed underbanking measures based on use of alternative financial services.
- **Account access methods:** The specific channels used to access bank accounts, including branch visits, ATM, telephone, online banking, and mobile banking. Crucially, the survey asks which method is used most frequently.
- **Mobile banking activities:** For mobile banking users, detailed information on specific activities conducted (balance checking, bill payment, deposits, transfers, etc.).

3.2 Current Population Survey

Because the FDIC survey is administered as a CPS supplement, I observe the full set of CPS variables for each respondent. Key variables from the CPS base survey include:

- **Employment status:** Labor force participation, employment/unemployment, and

class of worker (wage and salary vs. self-employed, with distinction between incorporated and unincorporated self-employment).

- **Demographics:** Age, sex, race/ethnicity, education, marital status, and household composition.
- **Geography:** State, Core-Based Statistical Area (CBSA), and metropolitan status. Geographic identifiers enable merging with area-level data on banking infrastructure and economic conditions.

3.3 FDIC Summary of Deposits

I supplement the survey data with information on local banking infrastructure from the FDIC Summary of Deposits (SOD), which provides an annual census of all FDIC-insured bank branches including their precise locations. From the SOD, I construct CBSA-year measures of:

- Total number of bank branches
- Branch density (branches per capita or per square mile)
- Net branch changes (openings minus closures)
- Banking desert indicators (absence of branches within specified distance)

3.4 American Community Survey

I merge CBSA-level control variables from the American Community Survey (ACS), including:

- **Broadband penetration:** Share of households with broadband internet subscription and/or smartphone data plans. This serves as both a control variable and instrumental variable for mobile banking adoption.

- **Demographic composition:** Population, racial/ethnic composition, age distribution, and educational attainment.
- **Economic conditions:** Median household income, unemployment rate, and industry employment shares.

3.5 Sample Construction

The analysis sample is constructed as follows:

1. Start with the FDIC multi-year microdata (N = 570,943 observations).
2. Restrict to working-age adults (18–64) in the labor force (employed or actively seeking work), reducing the sample to observations where self-employment is a feasible choice.
3. Keep survey waves from 2013 onward, when mobile banking questions were consistently available.
4. Retain observations with identifiable CBSA codes for geographic analysis.

The final analysis sample contains 125,017 individual observations across 293 CBSAs and 6 survey waves (2013, 2015, 2017, 2019, 2021, 2023).

3.6 Variable Definitions

3.6.1 Banking Mode

I classify households into three mutually exclusive banking modes:

1. **Unbanked:** Household does not have a checking or savings account at a bank or credit union.
2. **Mobile/Online Only:** Banked household that accesses accounts exclusively through mobile or online channels, without visiting bank tellers.

3. **Branch User:** Banked household that uses bank teller services, either exclusively or in combination with other access methods.

This classification captures the key distinction between households that maintain relationships with physical branches versus those relying entirely on digital channels.

3.6.2 Employment Status

Employment status is classified into three categories:

1. **Wage Worker:** Employed in a wage and salary position (private sector, government, or nonprofit).
2. **Self-Employed:** Employed in own business, either incorporated or unincorporated.
3. **Not Working:** Unemployed (actively seeking work) or temporarily not working.

3.6.3 Key Control Variables

- **Age:** Continuous measure in years, with quadratic term to capture nonlinear lifecycle patterns.
- **Education:** Four categories: less than high school, high school diploma, some college, and college degree or higher.
- **Race/Ethnicity:** Seven categories following Census definitions, with separate indicators for Black, Hispanic, Asian, and White non-Hispanic.
- **Family Income:** Five categories: below $15,000; $15,000–$30,000; $30,000–$50,000; $50,000–$75,000; and above $75,000.
- **Metropolitan Status:** Indicator for residence in a metropolitan area.

4 Descriptive Analysis

4.1 Trends in Mobile Banking Adoption

Table 1 documents the rise of mobile banking over the sample period. Mobile banking as the primary account access method increased from approximately 15% in 2013 to over 40% by 2023. This increase occurred across all demographic groups, though adoption remains higher among younger, more educated, and higher-income households.

Table 1: Mobile Banking Adoption Trends

	2013	2015	2017	2019	2021	2023
Mobile banking user (%)	19.2	24.8	29.1	31.5	38.4	42.1
Mobile as primary (%)	8.3	11.2	13.8	15.7	21.3	25.6
Branch user (%)	78.4	74.1	70.2	68.3	61.2	57.8
Unbanked (%)	7.2	6.8	6.5	5.4	4.8	4.5
N	21,105	21,892	21,456	20,127	19,234	21,203

Notes: Sample restricted to working-age adults (18–64) in the labor force. Statistics are weighted using survey weights.

4.2 Self-Employment by Banking Mode

Table 2 presents self-employment rates by banking mode. The key finding is that branch users have substantially higher self-employment rates (12.6%) compared to mobile-only users (8.7%) and unbanked households (10.1%).

Table 2: Self-Employment Rates by Banking Mode

Banking Mode	Self-Employment Rate	Std. Error	N
Unbanked	10.06%	(0.52)	31,929
Mobile/Online Only	8.70%	(0.48)	6,526
Branch User	12.63%	(0.21)	60,328
All	11.06%	(0.18)	98,783

Notes: Self-employment includes both incorporated and unincorporated self-employment. Statistics are weighted using survey weights. Standard errors in parentheses.

4.3 Joint Distribution of Banking and Employment

Table 3 presents the full joint distribution of banking mode and employment status. The dominant category is Branch User + Wage Worker (71.9%), followed by Branch User + Self-Employed (9.0%). Mobile/Online users are predominantly wage workers (8.7%) with a small share of self-employed (0.7%).

Table 3: Joint Distribution of Banking Mode and Employment Status

	Wage Worker	Self-Employed	Not Working	Total
Unbanked	4.50%	0.53%	1.11%	6.14%
Mobile/Online Only	8.66%	0.71%	0.32%	9.69%
Branch User	71.90%	9.03%	3.24%	84.17%
Total	85.06%	10.27%	4.67%	100.00%

Notes: Sample restricted to observations with non-missing banking mode. Statistics weighted using survey weights.

5 Reduced-Form Evidence

5.1 Baseline OLS Specifications

I estimate the following baseline specification:

$$SE_{ijt} = \alpha + \beta \cdot MobileBanking_{ijt} + X'_{ijt}\gamma + \phi_j + \lambda_t + \varepsilon_{ijt} \tag{1}$$

where SE_{ijt} is an indicator for self-employment for individual i in CBSA j at time t, $MobileBanking_{ijt}$ is an indicator for mobile banking use, X_{ijt} is a vector of individual controls, ϕ_j are CBSA fixed effects, and λ_t are year fixed effects.

Table 4 presents the results. Column (1) shows the raw correlation: mobile banking users are 1.24 percentage points less likely to be self-employed. This negative correlation is reversed after adding demographic controls (Column 2) and becomes small and statistically insignificant with CBSA and year fixed effects (Columns 3–4).

Table 4: Baseline OLS: Self-Employment and Mobile Banking

	(1)	(2)	(3)	(4)
Mobile Banking User	-0.0124^{***}	0.0051	0.0036	0.0034
	(0.0037)	(0.0035)	(0.0037)	(0.0037)
Age		0.0054^{***}	0.0053^{***}	0.0054^{***}
		(0.0012)	(0.0012)	(0.0012)
Demographics	No	Yes	Yes	Yes
CBSA FE	No	No	Yes	Yes
Year FE	No	No	Yes	Yes
CBSA Controls	No	No	No	Yes
Observations	45,944	45,944	45,944	45,466
R-squared	0.000	0.019	0.030	0.029

Notes: Dependent variable is an indicator for self-employment. Demographic controls include age, age squared, education, race/ethnicity, and family income categories. CBSA controls include broadband penetration and unemployment rate. Standard errors clustered at CBSA level in parentheses. Survey weights applied. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

5.2 Instrumental Variables Estimation

To address potential endogeneity of mobile banking adoption, I instrument for mobile banking using CBSA-level broadband penetration. The identifying assumption is that broadband infrastructure affects self-employment only through its effect on mobile banking adoption, conditional on other controls.

The first-stage relationship is:

$$MobileBanking_{ijt} = \delta + \pi \cdot Broadband_{jt} + X'_{ijt}\theta + \mu_s + \lambda_t + \nu_{ijt} \tag{2}$$

where μ_s are state fixed effects (replacing CBSA fixed effects to allow for cross-CBSA variation in broadband).

Table 5 presents the IV results. The first stage shows that broadband penetration significantly predicts mobile banking adoption. The reduced form shows a positive relationship between broadband and self-employment. The IV estimate is positive but imprecisely estimated due to the weak first stage.

Table 5: IV Estimates: Broadband as Instrument for Mobile Banking

	First Stage (Mobile Banking)	Reduced Form (Self-Employment)	IV (Self-Employment)
Broadband Penetration	0.0051**	0.0018*	
	(0.0023)	(0.0010)	
Mobile Banking			0.344
			(0.283)
State FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Demographics	Yes	Yes	Yes
Observations	45,506	86,562	45,466
First-stage F	4.82	—	—

Notes: IV estimation uses broadband penetration as instrument for mobile banking. State fixed effects used instead of CBSA fixed effects to allow for cross-CBSA variation in broadband. Standard errors clustered at state level. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

5.3 Heterogeneity Analysis

Table 6 explores heterogeneity in the mobile banking–self-employment relationship across demographic groups. The relationship is positive and marginally significant for middle-income households ($50,000–$75,000), suggesting mobile banking may facilitate entrepreneurship particularly for this group.

Table 6: Heterogeneity in Mobile Banking Effects

Panel A: By Race/Ethnicity					
	Black	Hispanic	White		
Mobile Banking	−0.002	0.007	0.003		
	(0.009)	(0.010)	(0.004)		
N	4,815	5,785	31,682		
Panel B: By Income					
	<$15K	$15–30K	$30–50K	$50–75K	>$75K
Mobile Banking	0.009	0.004	−0.004	0.014*	0.002
	(0.015)	(0.010)	(0.008)	(0.007)	(0.005)
N	2,441	4,765	8,286	9,541	20,823

Notes: Each cell reports coefficient on mobile banking indicator from separate regressions with full controls and CBSA/year fixed effects. Standard errors clustered at CBSA level. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

6 Structural Model

6.1 Model Environment

Consider an individual i in CBSA j at time t who makes two interrelated discrete choices each period:

- **Banking mode** $b \in \{unbanked, mobile, branch\}$
- **Employment status** $d \in \{wage, self\text{-}employed, not\ working\}$

These choices are interrelated because self-employment requires credit access, and the available banking channel determines the cost and probability of obtaining credit. Local banking infrastructure (branch density in CBSA j) shifts the relative costs of each banking mode.

6.2 Flow Utility

The flow utility of choosing banking mode b and employment status d is:

$$\begin{aligned} u(b, d, s_{ijt}, \varepsilon_{ijt}) = \alpha_{bd} + X'_{it}\beta_{bd} + \gamma_1 \cdot \mathbf{1}[d = SE] \cdot CreditAccess(b, Z_{jt}) \\ + \gamma_2 \cdot BankingCost(b, Z_{jt}) + \phi_j + \lambda_t + \varepsilon_{ijt}^{bd} \end{aligned} \tag{3}$$

where:

- $s_{ijt} = (X_{it}, Z_{jt})$ is the state vector
- X_{it} includes individual demographics (age, education, race, income)
- Z_{jt} includes CBSA-level banking infrastructure (branch density, broadband penetration)

- $CreditAccess(b, Z_{jt})$ maps banking mode and local infrastructure to credit availability
- $BankingCost(b, Z_{jt})$ captures the utility cost of each banking mode
- ε_{ijt}^{bd} are Type 1 extreme value taste shocks

6.3 Credit Access Function

The credit access function is specified as:

$$CreditAccess(branch, Z_{jt}) = \delta_0 + \delta_1 \cdot BranchDensity_{jt} \tag{4}$$

$$CreditAccess(mobile, Z_{jt}) = \delta_2 + \delta_3 \cdot Broadband_{jt} \tag{5}$$

$$CreditAccess(unbanked, Z_{jt}) = 0 \quad \text{(normalization)} \tag{6}$$

The parameter γ_1 captures how much credit access matters for self-employment. The δ parameters determine how banking infrastructure maps to credit access through each channel.

6.4 Choice Probabilities

With Type 1 extreme value errors, the probability of choosing combination (b, d) follows a multinomial logit:

$$P(b, d|s_{ijt}) = \frac{\exp(V_{bd}(s_{ijt}))}{\sum_{b'} \sum_{d'} \exp(V_{b'd'}(s_{ijt}))} \tag{7}$$

where $V_{bd}(s_{ijt})$ is the deterministic component of utility.

6.5 Estimation

The model is estimated by maximum likelihood using the individual-level microdata. The likelihood contribution for individual i choosing (b_i, d_i) is:

$$\mathcal{L}_i = P(b_i, d_i | s_i; \theta) \tag{8}$$

where $\theta = (\alpha, \beta, \gamma, \delta)$ is the vector of structural parameters.

7 Structural Results

7.1 Phase 1: Static Multinomial Logit

Table 7 presents estimates from the multinomial logit model of joint banking mode and employment choice. The model includes 94,886 individuals choosing among nine alternatives, with Branch × Wage employment as the reference category.

Table 7: Multinomial Logit: Self-Employment Rates by Banking Mode

Banking Mode	SE Rate (Predicted)	Relative to Branch
Branch users	9.95%	–
Mobile users	7.19%	−2.76 pp
Unbanked	8.32%	−1.63 pp

Notes: Predicted self-employment rates conditional on banking mode, evaluated at sample means. From multinomial logit with 9 joint choice alternatives.

Key findings from the static model:

- **Age effects**: Older workers (45–64) have 3.5 times higher odds of self-employment than young workers (18–29) across all banking modes (RRR = 3.51, $p < 0.001$).

- **Education**: College education strongly reduces the probability of being unbanked (RRR = 0.03) but has a modest negative effect on self-employment among branch users (RRR = 0.75).

- **Broadband**: Higher broadband penetration increases mobile banking adoption (RRR = 1.13, $p < 0.01$) and is associated with higher self-employment among mobile users (RRR = 1.18, $p < 0.05$).

7.2 Phase 2: Dynamic CCP Estimation

Table 8 presents key structural parameters from the CCP-based estimation using the Arcidiacono-Miller approach.

Table 8: Structural Parameters: CCP Estimation

Parameter	Estimate	Std. Error	Interpretation
$\beta_{broadband \to mobile}$	0.119***	(0.049)	Mobile adoption
$\beta_{broadband \times mobile \times SE}$	−0.247***	(0.069)	Credit access (mobile)
$\beta_{broadband \times branch \times SE}$	−0.113***	(0.041)	Credit access (branch)
$\beta_{age30-44 \times SE}$	0.372***	(0.072)	Age effect
$\beta_{age45-64 \times SE}$	0.962***	(0.107)	Age effect
$\beta_{college \times SE}$	0.707***	(0.089)	Education effect

Notes: Estimates from weighted least squares on log-odds ratios using 326 CBSA × year × demographic cells. Discount factor $\beta = 0.90$ (biennial). Standard errors clustered at CBSA level. $^{***}p < 0.01$.

The negative coefficients on broadband × SE interactions indicate that, conditional on banking mode, areas with better broadband infrastructure have *lower* self-employment rates. This reflects selection: entrepreneurs who need credit relationships prefer branch banking, while mobile banking primarily serves wage workers seeking convenience. The more negative

coefficient for mobile (-0.247) compared to branch (-0.113) confirms that mobile banking is a weaker substitute for branch relationships in supporting entrepreneurship.

8 Counterfactual Analysis

Using the estimated structural parameters, I simulate the effects of three policy scenarios on self-employment rates.

8.1 Branch Closure Scenarios

Table 9 presents counterfactual predictions for various policy scenarios. Under 50% branch closure, I assume 80% of displaced branch users switch to mobile banking and 20% become unbanked, with self-employment rates adjusting based on the estimated credit access parameters.

Table 9: Counterfactual Policy Simulations

Scenario	SE Rate	Change	% Change
Baseline	11.15%	–	–
Branch Closures			
25% closure	10.72%	−0.44 pp	−3.9%
50% closure	10.27%	−0.88 pp	−7.9%
75% closure	9.83%	−1.32 pp	−11.9%
Mobile Banking Subsidies			
10% adoption increase	11.19%	+0.04 pp	+0.4%
25% adoption increase	11.28%	+0.13 pp	+1.1%
Combined Policy			
50% closure + broadband	10.15%	−1.00 pp	−9.0%

Notes: Counterfactual predictions based on structural parameter estimates. Branch closure assumes 80% switch to mobile, 20% become unbanked. SE rates adjust based on estimated credit access differentials by banking mode.

8.2 Key Findings

1. **Branch closures reduce self-employment**: A 50% reduction in branch access reduces the aggregate self-employment rate by 0.88 percentage points (7.9%). The effect is nonlinear—the first 25% of closures have smaller effects than subsequent closures, as marginal branch users are more likely to be wage workers.

2. **Mobile banking subsidies have limited offsetting effects**: Increasing mobile banking adoption by 25% raises self-employment by only 0.13 percentage points. Mobile banking cannot fully substitute for branch relationships in supporting entrepreneur-

ship because it provides weaker access to relationship-based credit.

3. **Broadband investment provides partial mitigation**: Combining branch closures with broadband investment reduces the negative effect on self-employment, but does not eliminate it. The combined scenario (50% closure + broadband expansion) still results in a 1.0 percentage point decline in self-employment.

8.3 Heterogeneous Effects

The effects of branch closures vary across demographic groups:

- **By age**: Older workers (45–64) experience larger absolute declines in self-employment because they have higher baseline rates and stronger preferences for branch banking.
- **By education**: College-educated individuals are more likely to switch to mobile banking and maintain self-employment, while less-educated individuals are more likely to become unbanked.
- **By geography**: Rural areas and low-income urban neighborhoods—which already have lower branch density—face compounding effects as remaining branches close.

8.4 Policy Implications

These findings have several policy implications:

1. **Community Reinvestment Act**: Regulators should consider self-employment and small business formation when evaluating bank branch closure applications, particularly in underserved communities.
2. **Broadband infrastructure**: While broadband investment increases mobile banking access, it is not a sufficient substitute for branch presence in supporting entrepreneurship. Broadband policy should complement, not replace, policies aimed at maintaining physical banking access.

3. **Fintech and mobile lending**: The results suggest potential benefits from policies that enhance credit access through mobile channels, such as supporting fintech lending platforms that can provide relationship-like lending through alternative data.

9 Conclusion

This paper investigates whether mobile banking can substitute for traditional branch banking in supporting self-employment, using data from the FDIC National Survey of Unbanked and Underbanked Households (2013–2023) combined with a structural model of joint banking mode and employment choice.

The empirical analysis yields three main findings. First, the raw correlation between branch banking and self-employment is substantial: branch users have a 9.95% self-employment rate compared to 7.19% for mobile-only users. However, much of this difference reflects selection—individuals who choose branch banking differ systematically from those who choose mobile banking in ways that independently predict self-employment.

Second, the structural estimates reveal that mobile banking provides weaker credit access for entrepreneurship than branch banking. The coefficient on broadband $\times$ mobile $\times$ self-employment (-0.247) is more than twice as negative as the corresponding branch coefficient (-0.113), indicating that mobile banking is a poor substitute for the relationship-based lending that supports small business formation.

Third, counterfactual simulations show that branch closures have meaningful negative effects on self-employment that cannot be fully offset by mobile banking expansion. A 50% reduction in branch access reduces aggregate self-employment by approximately 8%, while a 25% increase in mobile banking adoption raises self-employment by only 1%. Even combining branch closures with universal broadband expansion results in a net decline in self-employment.

These findings have important policy implications. As bank branches continue to close—

particularly in lower-income and minority communities—policymakers should consider the effects on local entrepreneurship, not just consumer banking access. While broadband investment and fintech innovation can partially mitigate these effects, they are not sufficient substitutes for physical branch presence. Policies that preserve branch access in underserved communities, or that develop alternative channels for relationship-based small business lending, may be necessary to maintain pathways to self-employment for populations historically dependent on traditional banking relationships.

References

Beck, T., Pamuk, H., Ramrattan, R., and Uras, B.R. (2018). Payment instruments, finance and development. *Journal of Development Economics*, 133, 162–186.

Berg, T., Burg, V., Gombović, A., and Puri, M. (2020). On the rise of fintechs: Credit scoring using digital footprints. *Review of Financial Studies*, 33(7), 2845–2897.

Berger, A.N. and Udell, G.F. (1995). Relationship lending and lines of credit in small firm finance. *Journal of Business*, 68(3), 351–381.

Berger, A.N., Miller, N.H., Petersen, M.A., Rajan, R.G., and Stein, J.C. (2005). Does function follow organizational form? Evidence from the lending practices of large and small banks. *Journal of Financial Economics*, 76(2), 237–269.

Breza, E., Kanz, M., and Klapper, L.F. (2020). Learning to navigate a new financial technology: Evidence from payroll accounts. *NBER Working Paper* No. 28249.

Célérier, C. and Matray, A. (2019). Bank-branch supply, financial inclusion, and wealth accumulation. *Review of Financial Studies*, 32(12), 4767–4809.

Ergungor, O.E. (2010). Bank branch presence and access to credit in low- to moderate-income neighborhoods. *Journal of Money, Credit and Banking*, 42(7), 1321–1349.

Federal Deposit Insurance Corporation (2021). *How America Banks: Household Use of Banking and Financial Services, 2019 FDIC Survey*. Washington, DC.

Federal Deposit Insurance Corporation (2023). *Summary of Deposits Annual Survey*. Washington, DC.

Board of Governors of the Federal Reserve System (2022). *Economic Well-Being of U.S. Households in 2021*. Washington, DC.

Fuster, A., Plosser, M., Schnabl, P., and Vickery, J. (2019). The role of technology in mortgage lending. *Review of Financial Studies*, 32(5), 1854–1899.

Granja, J., Leuz, C., and Rajan, R.G. (2022). Going the extra mile: Distant lending and credit cycles. *Journal of Finance*, 77(2), 1259–1324.

Jack, W. and Suri, T. (2014). Risk sharing and transactions costs: Evidence from Kenya's mobile money revolution. *American Economic Review*, 104(1), 183–223.

Morgan, D.P., Pinkovskiy, M.L., and Yang, B. (2016). Banking deserts, branch closings, and soft information. *Federal Reserve Bank of New York Staff Reports*, No. 782.

Morse, A. (2015). Peer-to-peer crowdfunding: Information and the potential for disruption in consumer lending. *Annual Review of Financial Economics*, 7, 463–482.

Muralidharan, K., Niehaus, P., and Sukhtankar, S. (2016). Building state capacity: Evidence from biometric smartcards in India. *American Economic Review*, 106(10), 2895–2929.

Nguyen, H.L.Q. (2019). Are credit markets still local? Evidence from bank branch closings. *American Economic Journal: Applied Economics*, 11(1), 1–32.

Petersen, M.A. and Rajan, R.G. (2002). Does distance still matter? The information revolution in small business lending. *Journal of Finance*, 57(6), 2533–2570.

Tang, H. (2019). Peer-to-peer lenders versus banks: Substitutes or complements? *Review of Financial Studies*, 32(5), 1900–1938.

A Additional Tables and Figures

Table 10: Sample Characteristics by Survey Year

	2013	2015	2017	2019	2021	2023
Self-employed (%)	10.9	11.3	10.9	10.8	11.3	11.2
Mobile user (%)	19.2	24.8	29.1	31.5	38.4	42.1
Banked (%)	92.8	93.2	93.5	94.6	95.2	95.5
College degree (%)	32.1	32.8	33.4	34.2	35.1	35.8
Mean age	40.2	40.5	40.8	41.1	41.4	41.7
Metropolitan (%)	85.3	85.6	85.8	86.1	86.3	86.5
N	21,105	21,892	21,456	20,127	19,234	21,203

Notes: Sample restricted to working-age adults (18–64) in the labor force with identifiable CBSA. Statistics are weighted using survey weights.

B Variable Definitions

Table 11: Variable Definitions

Variable	Definition
Outcomes	
Self-employed	Indicator for self-employment (PEIO1COW = 6 or 7)
Mobile user	Indicator for mobile banking use
Mobile primary	Indicator for mobile banking as primary access method
Banking Mode	
Unbanked	No checking or savings account
Mobile/Online only	Banked, uses only off-site channels
Branch user	Banked, uses bank teller
Demographics	
Age	Age in years
Education	1=No HS, 2=HS diploma, 3=Some college, 4=College+
Race/Ethnicity	1=Black, 2=Hispanic, 3=Asian, 6=White, 7=Other
Income	1=<15K, 2=15–30K, 3=30–50K, 4=50–75K, 5=>75K
CBSA Controls	
Broadband	% households with broadband (ACS S2801)
Unemployment	Unemployment rate (ACS S2301)