



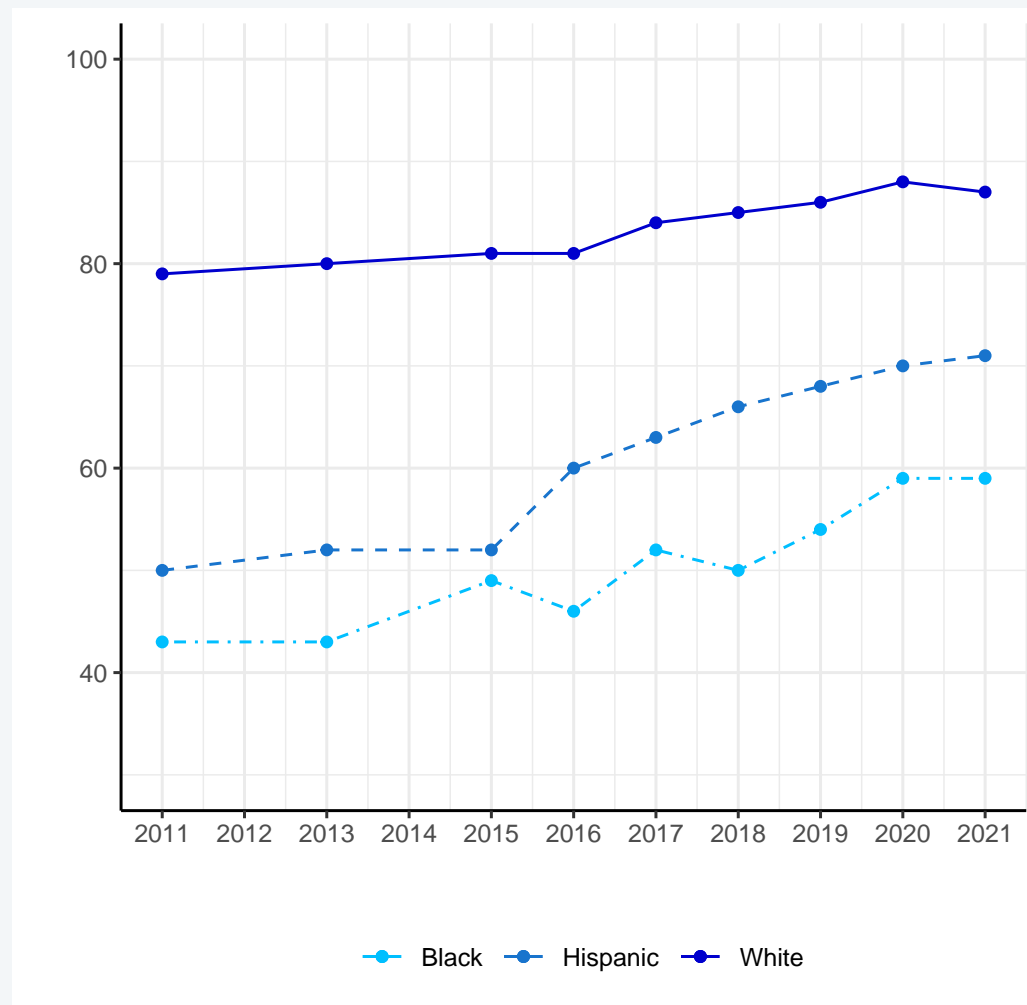
Post-Pandemic Financial Inclusion and the Impact of Digital Payments

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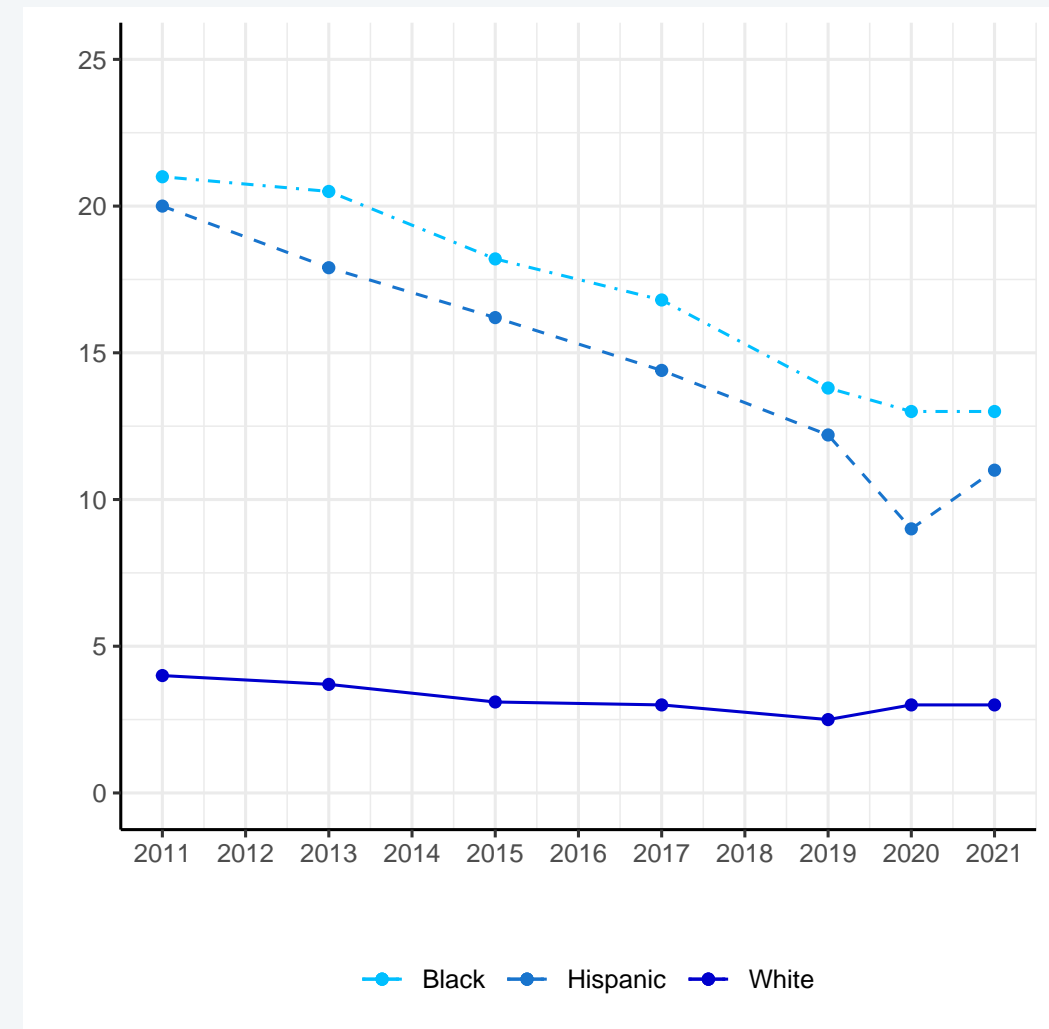
Overall, US access to banking improved over the past decade

Unbanked share almost halved for Blacks and Hispanics

(a) Fully banked share by race



(b) Unbanked share by race

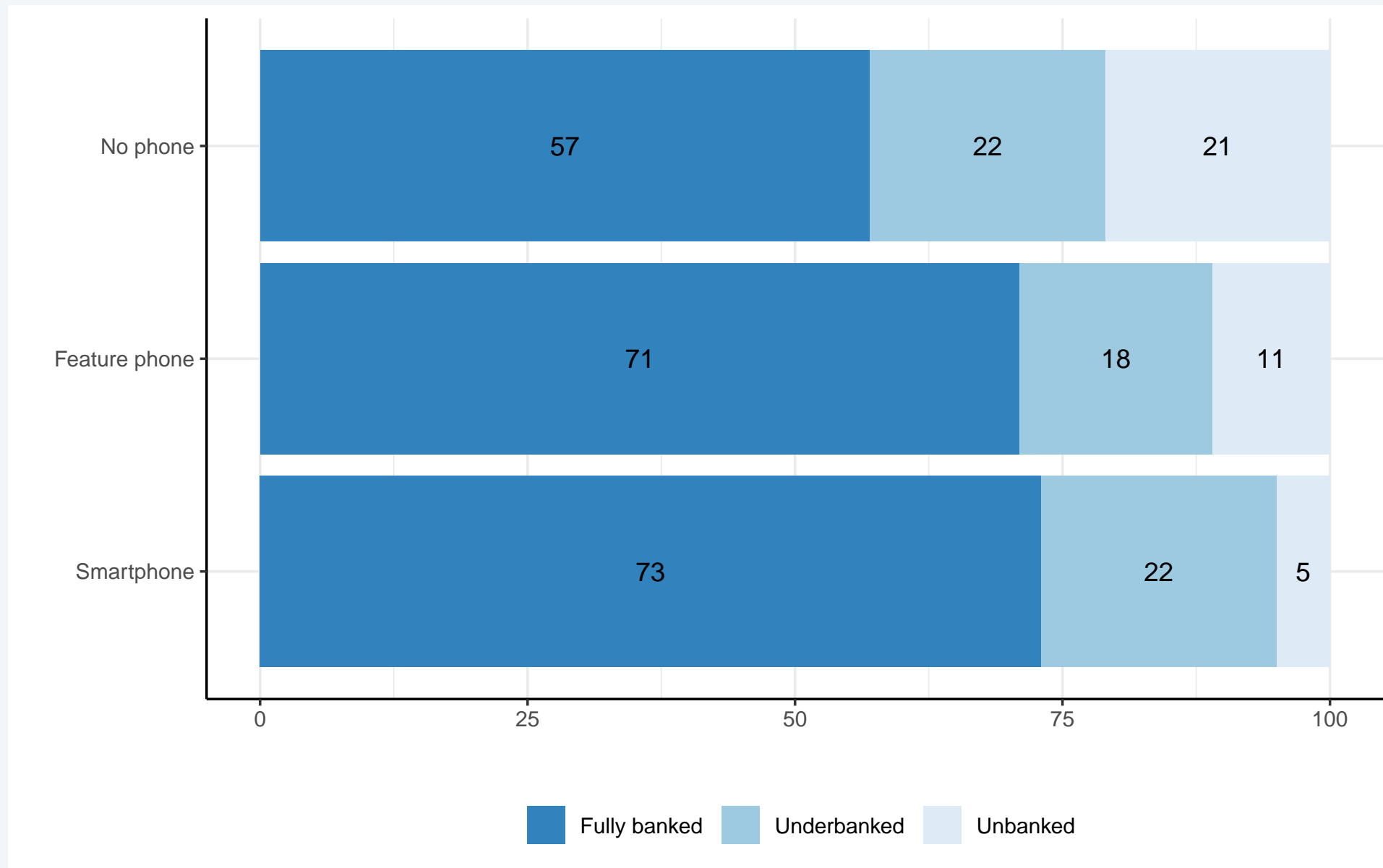


Source: Fully banked shares for 2011, 2013, 2015 from Federal Deposit Insurance Corporation (FDIC) Survey of Households Use of Banking and Financial Services; from 2016 onwards from annual Federal Reserve reports on Economic Well-Being of U.S. Households (SHED). Unbanked shares from FDIC reports for 2011, 2013, 2015, 2017, and 2019, and from Fed for 2020, 2021.

Mobile banking is a potentially important channel

Phone ownership associated with banking access

Figure: Banking status by phone ownership, USA, 2015

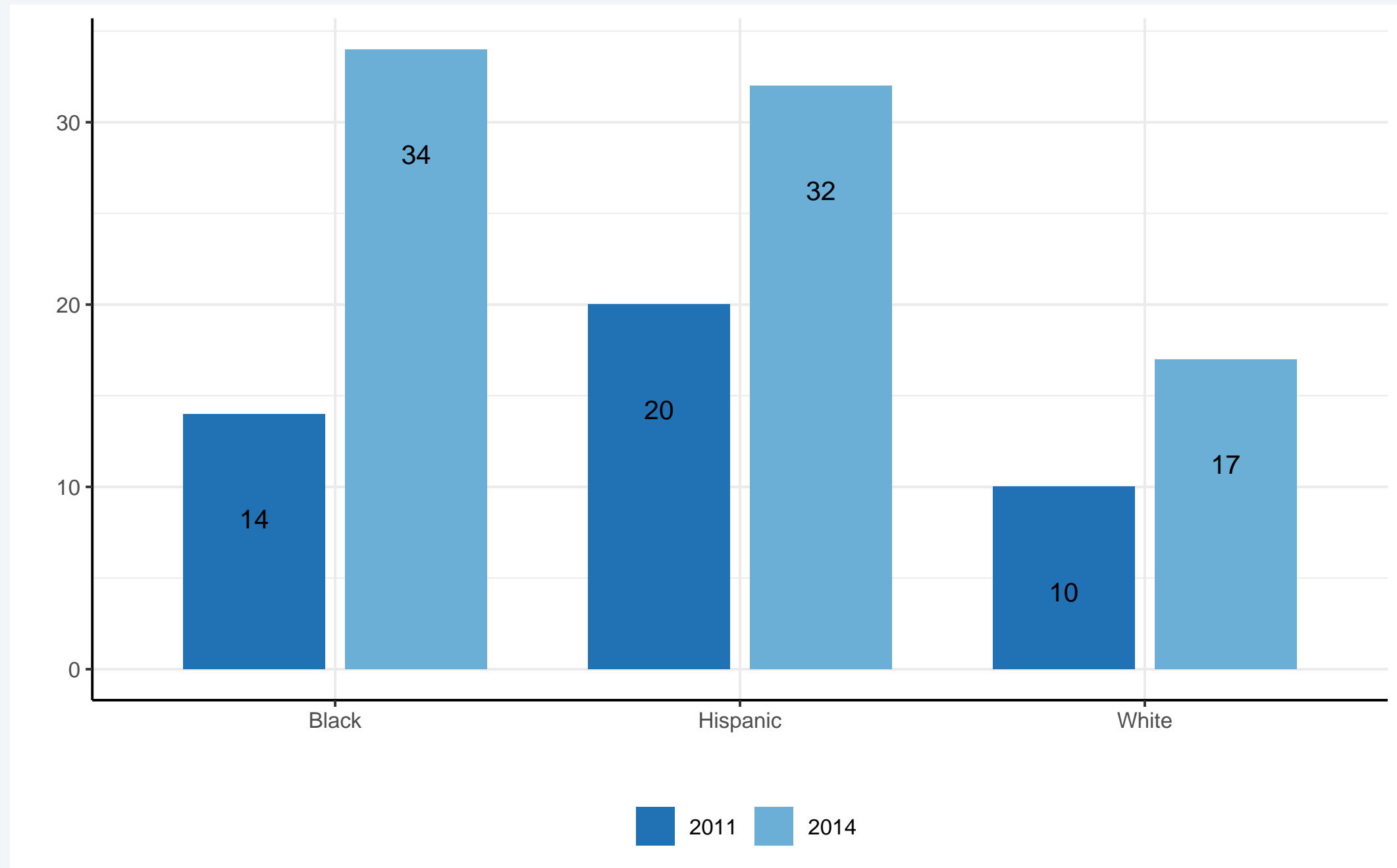


Source: Marginal distributions calculated from data provided by the Federal Reserve report on Consumers and Mobile Financial Services 2016, and FDIC 2015 Survey of Households Use of Banking and Financial Services

Non-whites more likely to use mobile payments

Mobile payments could hold potential to improve financial inclusion

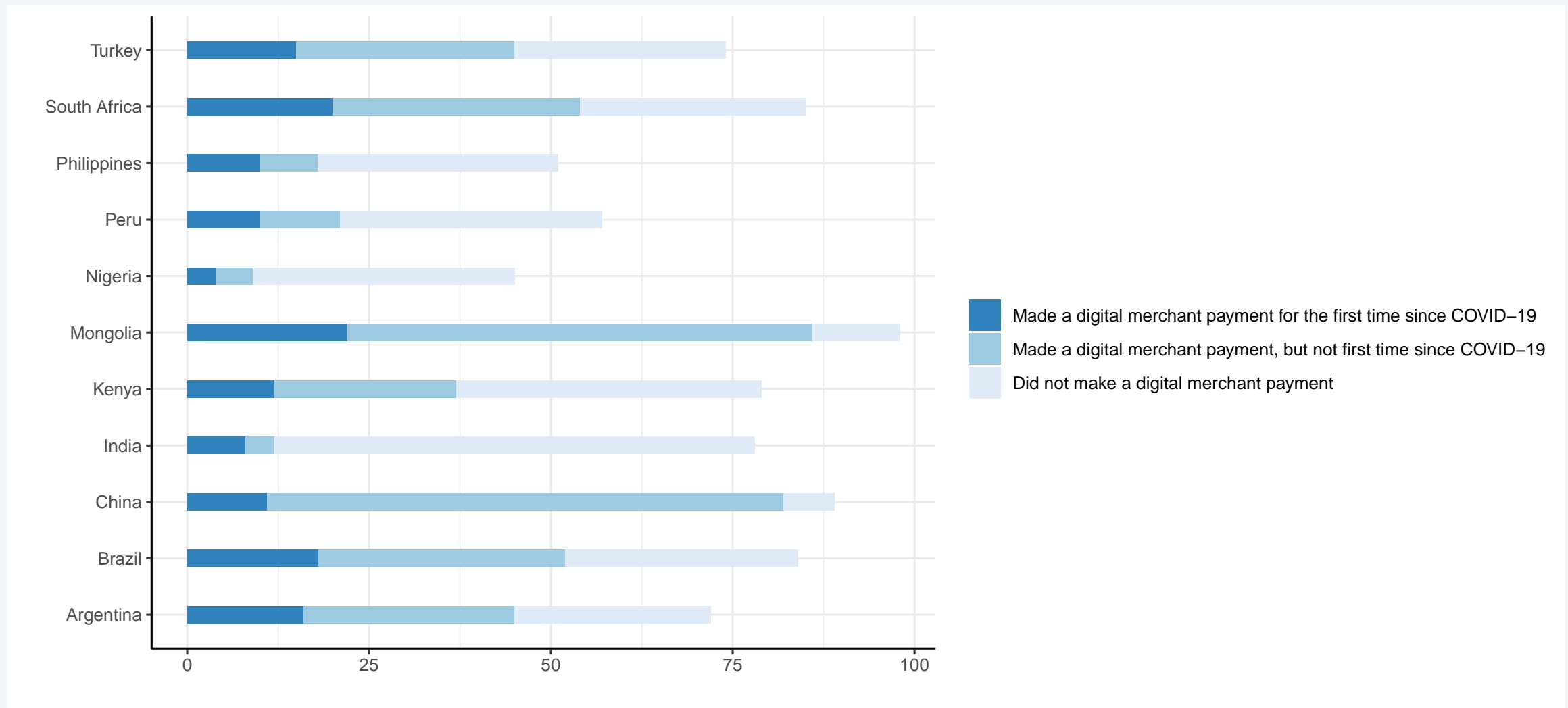
Figure: Use of mobile payments in the past 12 months, USA



Source: Federal Reserve report on Consumers and Mobile Financial Services 2016

World Bank: Pandemic spurred financial inclusion worldwide

Figure: The use and adoption of digital merchant payments during COVID-19



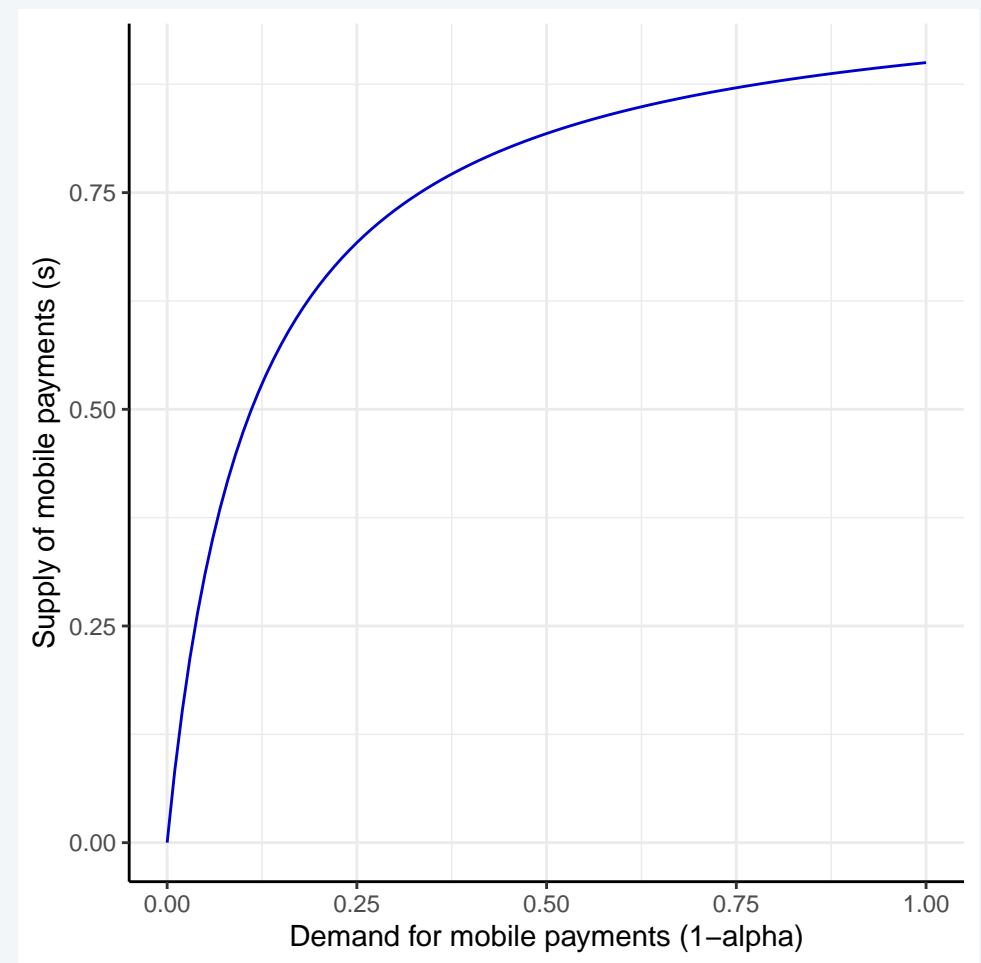
Source: The Global Findex database 2021, World Bank

A simple model of technological adoption

Customers and merchants, two-sided network/market

- ▶ Imagine two different customer types:
 - ▶ Type 1: (α) traditional fully-banked: only use mobile payments if supply s merchants take them.
 - ▶ Type 2: ($1 - \alpha$) mobile: prefer mobile payments, become fully banked to use them if they are taken.
- ▶ Merchants:
 - ▶ Share λ never provide mobile payments
 - ▶ Share $1 - \lambda$ provide mobile payments based on demand: $\alpha * s + (1 - \alpha)$
- ▶ If demand for mobile payments goes up (i.e., $\alpha \downarrow$), s of merchants rises \rightarrow more Type 2 customers become banked.

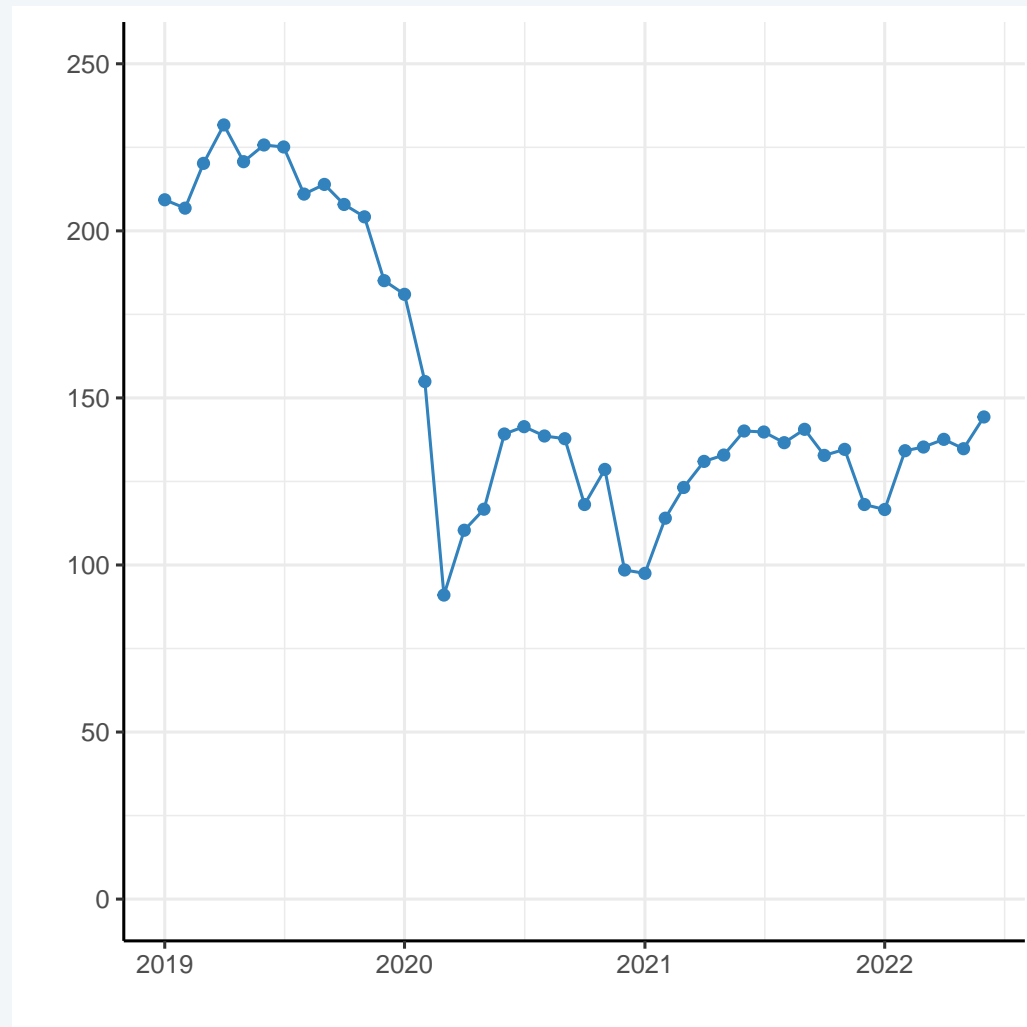
Figure: Supply as a function of demand



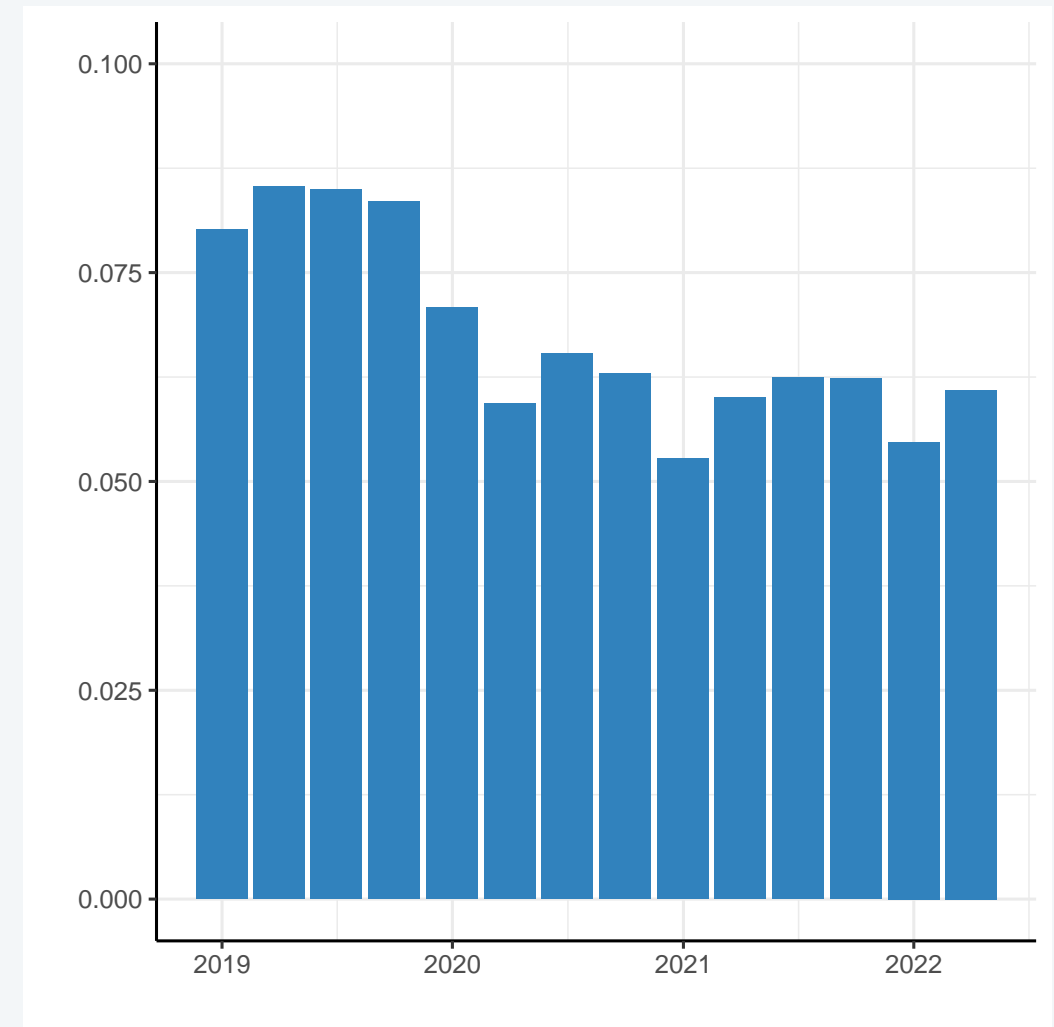
Pandemic was a negative shock to cash usage

Demand shock for mobile payments: ($\alpha \downarrow$)

(a) Monthly ATM transaction volume (millions)



(b) Cash withdrawal (GBP) share of HH consumption



Source: Data on transactions volumes from UK LINK network; cash withdrawal share calculated by combining LINK data with household consumption data from the UK office for National Statistics

Could pandemic rises in digital payments increase inclusion?

Back of the envelope: Possible increase in minorities who are fully banked

▶ Assumptions:

- ▶ Baseline: 86% Whites fully banked in 2019.
- ▶ Type 2 customers fully banked iff merchants allow mobile payments.

▶ Blacks:

- ▶ 54% fully banked, so $86\% - 54\% = 32$ pp Type 2 customers (mobile payments route to banking).
- ▶ Unbanked Type 2 customer share $32/86 = 37.2\%$

▶ Hispanics:

- ▶ Unbanked Type 2 customer share $18/86 = 20.9\%$

▶ Pandemic **increases in mobile payment acceptance**:

- ▶ US retailers accepting digital wallets up 12pp (44% (2019) to 56% (2021): US National Retail Federation).
- ▶ $12\text{pp} \times 37.2\% = 4.5\text{pp}$, i.e., 90% of total 2019-2021 increase in Black fully banked share;
- ▶ $12\text{pp} \times 20.9\% = 2.5$ pp, i.e., 84% of total 2019-2021 increase in Hispanic fully banked share.

APPENDIX

Model solution

- ▶ Total number of customers, who demand mobile payments is $d = 1 - \alpha + \alpha * s$
- ▶ Total number of merchants, who supply mobile payments is $s = (1 - \lambda)d = (1 - \lambda)(1 - \alpha + \alpha * s)$
- ▶ Solving for s , the number of suppliers is

$$s = \frac{1 - \lambda - (1 - \lambda)\alpha}{1 - (1 - \lambda)\alpha} \leq 1 - \lambda$$

and the number of customers demanding mobile payments is

$$d = \frac{1 - \alpha}{1 - (1 - \lambda)\alpha} \leq 1$$

- ▶ Supply $s \in [0, 1 - \lambda]$ is strictly decreasing in α .
- ▶ Note: the model doesn't impose demand equals supply; i.e. a customer, who wants to have mobile payments is able to trade with cash, if matched with a merchant, who does not provide mobile payments.

How much can mobile banking contribute to inclusion?

Revisit the model: additional assumptions

- ▶ Unit continuum of merchants, each matched to 3 customers: a white, a black, and a hispanic
- ▶ Share $s \leq 1 - \lambda$ provide mobile payments
- ▶ Customers need to be fully banked to use mobile payments; no underbanking considered
- ▶ Type 1 customers are always fully banked
- ▶ When a Type 2 customer meets a merchant, he will
 - ▶ open a bank account and use mobile payments, if the merchant provides mobile payments
 - ▶ remains unbanked and use cash, if the merchant does not provide mobile payments
- ▶ Assortative matching for white: all white Type 2 customers are matched with merchants providing mobile payments; i.e. all whites are fully banked (used to create a baseline)
- ▶ The racial differences in use of mobile payments represent differences in Type 2 customers; i.e. race-specific α s
- ▶ Pandemic shock does not lower banking status for anyone, and the pandemic increase in supply of mobile payments randomly assigned between Type 1 and 2 customers for Black and Hispanic

