FinTech and Consumer Well-Being in the Information Age

Bruce Carlin – UCLA Arna Olafsson – Copenhagen Business School Michaela Pagel – Columbia University

#### Motivation

 With the growing use of personal finance technology, people should be better equipped than ever to make good choices

#### Motivation

- With the growing use of personal finance technology, people should be better equipped than ever to make good choices
- The empirical challenge is to find data on both access to information and economic outcomes, and to deal with endogeneity, reverse causality, and omitted variables

#### Motivation

- With the growing use of personal finance technology, people should be better equipped than ever to make good choices
- The empirical challenge is to find data on both access to information and economic outcomes, and to deal with endogeneity, reverse causality, and omitted variables
- Using data from a financial aggregation software, we show that better technology improves decision-making
  - Logging in one more time per month reduces high-interest unsecured consumer debt by 14 percent over a two-year period
  - Late fees and other financial penalties are reduced too

## Data: From a financial aggregation app

We use a transaction-level panel dataset of spending, income, balances, limits, and logins by device recorded by a financial aggregation and service app in Iceland from 2011 to 2016

## Data: From a financial aggregation app

- We use a transaction-level panel dataset of spending, income, balances, limits, and logins by device recorded by a financial aggregation and service app in Iceland from 2011 to 2016
  - The advantages of using Icelandic data include
    - Icelanders (almost) never use cash
    - App is marketed through banks and we have a fairly representative sample
    - Income and spending are pre-categorized
    - App is for information purposes only (no transaction functionalities)

## Data: From a financial aggregation app

- We use a transaction-level panel dataset of spending, income, balances, limits, and logins by device recorded by a financial aggregation and service app in Iceland from 2011 to 2016
  - The advantages of using Icelandic data include
    - Icelanders (almost) never use cash
    - App is marketed through banks and we have a fairly representative sample
    - Income and spending are pre-categorized
    - App is for information purposes only (no transaction functionalities)
- Before November 2014, access to this personal information only occurred via the internet on a desktop or laptop computer whereas after a smart phone app was introduced

## The financial aggregation app: Screenshots



#### Raw data: Logins

Based on the raw data, there is an obvious discontinuity in the propensity of individuals to log into their financial accounts around the introduction of the mobile app



#### Raw data: Overdraft interest fees



 Up until the introduction of the app, overdraft interest increased but there was a trend change at the time of the app intro

#### Raw data: Late fees



Up until the introduction of the app, late fees increased but there was a trend change at the time of the app intro

 We exploit a discontinuity in individual access to financial accounts arising from the introduction of the app on November 14, 2014 (RDiT design)

- We exploit a discontinuity in individual access to financial accounts arising from the introduction of the app on November 14, 2014 (RDiT design)
- The timing of the app introduction is plausibly exogenous to individual characteristics but sorted individuals into different frequencies of logins

- We exploit a discontinuity in individual access to financial accounts arising from the introduction of the app on November 14, 2014 (RDiT design)
- The timing of the app introduction is plausibly exogenous to individual characteristics but sorted individuals into different frequencies of logins
- To the best of our knowledge, no other event took place around the same time

- We exploit a discontinuity in individual access to financial accounts arising from the introduction of the app on November 14, 2014 (RDiT design)
- The timing of the app introduction is plausibly exogenous to individual characteristics but sorted individuals into different frequencies of logins
- To the best of our knowledge, no other event took place around the same time
- We include individual fixed effects and other macroeconomic controls

- We exploit a discontinuity in individual access to financial accounts arising from the introduction of the app on November 14, 2014 (RDiT design)
- The timing of the app introduction is plausibly exogenous to individual characteristics but sorted individuals into different frequencies of logins
- To the best of our knowledge, no other event took place around the same time
- We include individual fixed effects and other macroeconomic controls
- No effects found for a placebo mobile app introduction taking place two years earlier

- We exploit a discontinuity in individual access to financial accounts arising from the introduction of the app on November 14, 2014 (RDiT design)
- The timing of the app introduction is plausibly exogenous to individual characteristics but sorted individuals into different frequencies of logins
- To the best of our knowledge, no other event took place around the same time
- We include individual fixed effects and other macroeconomic controls
- No effects found for a placebo mobile app introduction taking place two years earlier
- Complement within-individual identification with a cross-sectional diff-in-diff (DiD) approach

#### Regression Results

 One extra log in was associated with 224.1 Icelandic Krona (\$1.86 USD) fewer penalties incurred per month over a two-year period

#### Regression Results

- One extra log in was associated with 224.1 Icelandic Krona (\$1.86 USD) fewer penalties incurred per month over a two-year period
- Effects are mainly driven by the reduction in overdraft interest
  - ▶ 176.8 Krona per month for overdraft interest
  - Based on average \$1,356 overdraft debt and \$13 interest expense per month, this is a reduction of roughly 14%.
  - ► 53.2 Krona per month for late fees

## Regression Results

- One extra log in was associated with 224.1 Icelandic Krona (\$1.86 USD) fewer penalties incurred per month over a two-year period
- Effects are mainly driven by the reduction in overdraft interest
  - ▶ 176.8 Krona per month for overdraft interest
  - Based on average \$1,356 overdraft debt and \$13 interest expense per month, this is a reduction of roughly 14%.
  - ► 53.2 Krona per month for late fees
- Increase in credit card use versus overdrafts same time
  - Each additional login associated with a 2.36% increase in fraction of expenditures purchased with credit card
  - Credit card offers 30-50 day float.

#### Generational Differences: App Logins

Millennials > Gen X'ers > Baby Boomers

By 2016, 52% of Millenials versus 27% of Baby Boomers



# Generational Differences: Coholding Puzzle

- Baby Boomers and Gen Xers incur higher financial penalties than Millennials
  - Higher overdraft interest
  - More likely to incure late fees (28.6% and 33.1% versus 18.4%)
  - More likely to incur NSF fees (31.4% and 39.8% versus 27.4%)

# Generational Differences: Coholding Puzzle

- Baby Boomers and Gen Xers incur higher financial penalties than Millennials
  - Higher overdraft interest
  - More likely to incure late fees (28.6% and 33.1% versus 18.4%)
  - More likely to incur NSF fees (31.4% and 39.8% versus 27.4%)
- Older generations are more liquid
  - Higher cash reserves
  - 1.52 months of discretionary expenditures for Baby Boomers versus 1.09 for Millennials.

# Generational Differences: Coholding Puzzle

- Baby Boomers and Gen Xers incur higher financial penalties than Millennials
  - Higher overdraft interest
  - More likely to incure late fees (28.6% and 33.1% versus 18.4%)
  - More likely to incur NSF fees (31.4% and 39.8% versus 27.4%)
- Older generations are more liquid
  - Higher cash reserves
  - 1.52 months of discretionary expenditures for Baby Boomers versus 1.09 for Millennials.
- Baby Boomers and Gen Xers have more severe coholding behavior
  - Higher unnecessary overdrafts (\$150.9 and \$124.5 versus \$81.01)
  - Higher annual coholding costs (\$19.98 and \$16.49 versus \$10.73)

#### Conclusion

\* We document and quantify the welfare effects of better access to information using a unique panel of account logins and economic outcomes

## Conclusion

- \* We document and quantify the welfare effects of better access to information using a unique panel of account logins and economic outcomes
  - Empirically important given the growth of on-line education, social learning, and electronic access to information

## Conclusion

- \* We document and quantify the welfare effects of better access to information using a unique panel of account logins and economic outcomes
  - Empirically important given the growth of on-line education, social learning, and electronic access to information
- \* Implications for people of different generations
  - Different adoption rates and patterns of use of financial instruments
  - May have policy implications that vary across the population