Growing Up Without Finance

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w/ James R. Brown (Iowa State) & J. Anthony Cookson (Colorado)

FDIC Consumer Research Symposium, Fall 2016

These are not necessarily the views of the Federal Reserve Bank of Cleveland or the Board of Governors
Motivation

- Household finances affect entrepreneurship (Hurst and Lusardi, 2004), asset prices (Favara and Imbs, 2015), consumer welfare (Melzer, 2011), employment (Bernstein, 2016), employment credit screening ⇒ corporate financial policies? (Heimer, 20??)

- Why is poor financial health pervasive, even in good times?
  - e.g., 2006Q4: 4.5% unemployment. Yet 31% subprime, ~15% no credit history

- Literature: behavioral biases, financial education, and genetics.
  - But, effects cannot explain wide variation in financial health.

- Our Paper
  - The role of local financial development & exposure to financial markets.
  - Credible variation in local financial development on Native American reservations.
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Exposure to financial markets

- Example: 13-year old Rawley. Mows neighborhood lawns ⇒ deposits monthly check ⇒ builds relationship with local bank, Burke and Herbert in Alexandria, VA.

- Counterfactual: what if brick-and-mortar bank was not there?
- Empirical challenge: local financial development is not random
Exposure to financial markets

- Example: 13-year old Rawley. Mows neighborhood lawns ⇒ deposits monthly check ⇒ builds relationship with local bank, Burke and Herbert in Alexandria, VA.

- Counterfactual: what if brick-and-mortar bank was not there?
- Empirical challenge: local financial development is not random
Paper in a nutshell

Consumer credit on Native American reservations

- Long-run Congress-imposed differences in *courts* across resvns
- Stronger courts $\Rightarrow$ $\uparrow$ supply of resvn-area *financial development*
- $\uparrow$ fin dev $\Rightarrow$ $\uparrow$ *consumer finance* through early-life exposure
Setting and empirical strategy
A series of historical accidents & a 1953 law led to sharp differences in local finance

- Large, long-run differences in local financial development on Native American reservations.
  - ↓ debt contract enforcement uncertainty → 20% diff in bank branching, 60% diff in Pr(extend small business loan).
  - Cross-sectional pattern a historical accident (disclaimers in state constitutions, see Brown, Cookson, Heimer 2016).
Setting and empirical strategy
A series of historical accidents & a 1953 law led to sharp differences in local finance

- Large, long-run differences in local financial development on Native American reservations.
  - ↓ debt contract enforcement uncertainty → 20% diff in bank branching, 60% diff in Pr(extend small business loan).
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- 1953 PL280 was passed
- 1953-1980s Long-run differences in financial development emerge
- 1980s-1990s Borrowers in our sample are born, growing up with and without financial development.
- 1999-2015 Sample Period: Borrowers enter credit markets and manage credit histories as young adults.
Setting and empirical strategy

Use long-run differences in local financial development to study effects on household finances.

- U.S. Congress
  - State Courts: More Local Finance
    - Young Borrowers (< 25 years)
  - Tribal Courts: Less Local Finance
    - Young Borrowers (< 25 years)

Persistent, Externally-imposed Cross-sectional variation

State versus tribal affected banking development, but not consumer finance directly.
What we find

...using 5% sample of U.S. credit reports from Equifax

1. Less local financial development (*tribal versus state courts*) leads to...
   - **Less financial inclusion** (10 pp more individuals w/o credit reports).
   - **Delayed entry** into formal credit markets (10%-20% lower hazard).
     - Role for local finance: Less after growth of local finance after bank deregulation (IGBEA).

2. These effects are ...
   - Persistent (consumer credit risk scores take 10+ years to converge).
   - Explained by delayed entry (controlling for age at first credit).
   - Not explained by differences in economic opportunity, but...
   - ...explained by local banking development.
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Contributions

1. Financial inclusion (e.g. stock mkt participation, formal accounts)
   - Celerier and Matray (2015), Kozak and Sosyura (2015), Allen et al. (2012), and others ...

2. Does local finance still matter?
   - Guiso, Sapienza, and Zingales (2004), Cortes and Strahan (2016), Butler, Cornaggia, Gurun (2015), and others ...

3. Institutions and financial development
   - Much of this is cross-national (e.g., Levine, Djankov, Shleifer and many others).
   - Reservation (within-country) setting permits stronger inferences.
Reservation areas

PL280 was passed at the state-level, but has within-region variation.
PL280: What we know

- Similar resvn econ/financial conditions prior to PL280 (pre-PL280).

- Law intended to improve perceived “lawlessness,” but...
  - similar incarceration rates pre-PL280, no effect on criminal outcomes (Dimitrava-Graje et al 2015).
  - civil jurisdiction added as an “afterthought” (Goldberg-Ambrose).

- PL280 ⇒ more local finance by affecting secured lending (Brown, Cookson, Heimer 2016).
  - ... but does not apply to most consumer credit contracts.

- PL280 ⇒ higher incomes in finance-dependent industries (Brown, Cookson, Heimer 2016).
  - Main alternative: economic opportunity affects consumer finance.
  - If economic opportunity is scarce or unstable, no more consumer finance.
  - No credit for economic opportunity.
PL280: What we know

- Similar resvn econ/financial conditions prior to PL280

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- PL280 ⇒ higher incomes in finance-dependent industries (Brown, Cookson, Heimer 2016).
  - Main alternative: economic opportunity affects consumer finance.
    - Show explicit financial mechanism.
    - Controls for economic conditions.
Data

Data: FRBNY - Consumer Credit Panel

- 5% random sample quarterly credit reports - Equifax (1999 - ongoing).
- Sample on last 2 digits of SSN, panel refresh includes new entrants and indicate deaths.
- Limitations: limited demographic coverage, no household assets.
- Link census tracts to rsvn areas using Tiger Line GIS shape files.

All of the consumers we observe are on reservation lands for first Equifax record.
Consumer credit

PL280 and financial inclusion
Fraction of individuals with a credit history

Low-finance regions have lower rates of financial inclusion.
Delayed entry into credit markets

Consumer age when receive first credit report

Consumer age when receive first line of credit

Tribal courts
State jurisdiction
Delayed entry into credit markets

Hazard into formal credit mkts, 10 - 20 pp. log-odds.

### Panel A: time to first credit report

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<tr>
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<th>(2a)</th>
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<td>coef</td>
<td>[odds-ratio]</td>
<td>coef</td>
<td>[odds-ratio]</td>
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<tr>
<td>Census region FE</td>
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<tr>
<td>state FE</td>
<td>x</td>
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### Panel B: time to first tradeline

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<td>[odds-ratio]</td>
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<td>state FE</td>
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<td>( N ) (consumer-quarter)</td>
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<td>( N ) (consumers)</td>
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Financial mechanism: bank branching regulation

Is exposure to local finance the channel?

  - $\Rightarrow \uparrow$ bank branches in rural areas (Celerier and Matray, 2015).

- $\uparrow$ bank branching $\Rightarrow$
  - if tribal courts have too little finance, branching expansion matters.
Financial mechanism: bank branching regulation

Expansion of bank branch supply attenuates hazard rates.

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<td><strong>time to first report</strong></td>
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<td>deregulated</td>
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<td>coef [odds-ratio]</td>
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<td>N (consumers)</td>
<td>1,511</td>
<td>11,555</td>
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<td>N (consumers)</td>
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<td>11,555</td>
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Evidence on bank supply frictions

- Bank regulation results are consistent with supply frictions.
  - Effects are more pronounced where there is less bank branching.

- Can we provide evidence within Equifax?
  - Focus on lending to subprime borrowers to identify supply restrictions (as in Bhutta and Keys 2014).
  - **Supply ratio** = \# new credit lines / \# hard inquiries.
Evidence of a financial mechanism: Supply frictions?

<table>
<thead>
<tr>
<th>supply ratio</th>
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<td>x</td>
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<td>quarter FE</td>
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<td>$R^2$</td>
<td>0.040</td>
<td>0.060</td>
<td>0.059</td>
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</table>

sample of borrowers 25 years and younger, riskscore < 640
Supply frictions and the business cycle

Supply ratio looks like financial friction over the business cycle.
Effects on financial health
Overall financial health
Sample of borrowers who stay on the reservation.
Overall financial health

Sample of borrowers who stay on the reservation.

18 points lower average credit scores.

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<td>birth year FE</td>
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<td>$R^2$</td>
<td>0.037</td>
<td>0.041</td>
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sample: 25 years old or younger, on resvn entire sample
Overall financial health

Delayed entry fully explains long-run differences in financial health.

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<td>riskscore</td>
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<tr>
<td>age at first trade line</td>
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<td>-4.39***</td>
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<td>(0.45)</td>
<td>(0.65)</td>
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<tr>
<td>R²</td>
<td>0.33</td>
<td>0.46</td>
</tr>
</tbody>
</table>

sample: 28 years old and older, on resvn the entire sample

Brown, Cookson, Heimer
Growing Up Without Finance

24 / 39
Overall financial health
Economic significance

Economically meaningful differences in financial health

1. Default rate
   - Tribal → State court:
     - ↓ 10 pp implied probability of default (at sample means)

2. Suppose 100 28-year-olds demand a $100,000 mortgage
   - Tribal → State court:
     - 8 additional people eligible for conventional mortgage
     - $599 monthly savings for 40 borrowers previously eligible for homeownership
So far

State Courts
More Local Finance

Young Borrowers
(< 25 years)

Tribal Courts
Less Local Finance

Young Borrowers
(< 25 years)

Later entry to credit markets
Less financial inclusion
Face more financial frictions

Brown, Cookson, Heimer
Growing Up Without Finance
26 / 39
Are 'exposure effects' persistent?

- **State Courts**
  - More Local Finance
  - Young Borrowers (< 25 years)

- **Tribal Courts**
  - Less Local Finance
  - Young Borrowers (< 25 years)

Later entry to credit markets
Less financial inclusion
Face more financial frictions

**Movers to Off-Reservation Areas**
Do outcomes converge?
How persistent are effects?

Benchmark against movers from state court reservations
Financial health off-reservation

Moving from resvn helps tribal court consumers by 4 credit score points (convergence).

<table>
<thead>
<tr>
<th>riskscore</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>tribalcourt × off resvn</td>
<td>4.07***</td>
<td>3.54***</td>
<td>3.98***</td>
</tr>
<tr>
<td></td>
<td>(0.54)</td>
<td>(0.61)</td>
<td>(0.61)</td>
</tr>
<tr>
<td>off resvn</td>
<td>0.14</td>
<td>0.95</td>
<td>-0.22</td>
</tr>
<tr>
<td></td>
<td>(0.91)</td>
<td>(0.92)</td>
<td>(0.88)</td>
</tr>
<tr>
<td>date quarter FE</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>first tract FE</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>first tract × date FE</td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>current state FE</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>340,385</td>
<td>340,385</td>
<td>340,385</td>
</tr>
<tr>
<td><strong>R^2</strong></td>
<td>0.12</td>
<td>0.15</td>
<td>0.15</td>
</tr>
</tbody>
</table>

sample: borrowers who start on resvn
Financial health off-reservation

- Test assumption: borrower quality of movers are equal by jurisdiction.
- frac tradelines $> 90$ days past due, measure of “quality.”

state and tribal court borrowers are similar quality, so riskscore effect is unlikely selection.

<table>
<thead>
<tr>
<th>frac tradelines $&gt; 90$ days past due</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>tribalcourt</td>
<td>0.020</td>
<td>0.017</td>
<td>-0.10</td>
</tr>
<tr>
<td>date FE</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>first tract FE</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>birth cohort FE</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>current state FE</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$N$</td>
<td>31,803</td>
<td>31,803</td>
<td>31,803</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.14</td>
<td>0.14</td>
<td>0.15</td>
</tr>
</tbody>
</table>

Sample: borrowers 28 years or older, born on resvn, currently off resvn
Financial health off-reservation takes more than a decade for “growing up without finance” (tribal court) borrowers to catch up.

\[ \text{riskscore}_{it} = \gamma_t + \beta_1 \text{quarters away}_{it} + \beta_2 \text{birthyear}_{i} + \epsilon_{it} \]
Local finance or economic opportunity?
Local finance or economic opportunity?

state courts and bank branches ⇒ better long-run financial health, even controlling for local opportunities.

<table>
<thead>
<tr>
<th></th>
<th>dep var = riskscore</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1a)</td>
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<tr>
<td>tribalcourt</td>
<td>-7.91***</td>
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<tr>
<td></td>
<td>(2.87)</td>
</tr>
<tr>
<td>bank branches (Z)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>median tract income</td>
<td></td>
</tr>
<tr>
<td>tract employment rate</td>
<td>x</td>
</tr>
<tr>
<td>census region - quarter FE</td>
<td>x</td>
</tr>
<tr>
<td>N</td>
<td>12,285</td>
</tr>
</tbody>
</table>

Sample: 28 years old and older, on resvn the entire sample
credit demand conditions are similar (consistent with 'exposure effect' not economic opportunities).

<table>
<thead>
<tr>
<th></th>
<th>(1b)</th>
<th>(2b)</th>
<th>(3b)</th>
<th>(4b)</th>
<th>(5b)</th>
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<tbody>
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<td>tribalcourt</td>
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<td>0.079</td>
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<tr>
<td></td>
<td>(0.057)</td>
<td>(0.057)</td>
<td>(0.15)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>bank branches (Z)</td>
<td></td>
<td></td>
<td>0.16</td>
<td>0.16</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.12)</td>
<td>(0.12)</td>
<td>(0.12)</td>
</tr>
<tr>
<td>median tract income</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>tract employment rate</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>census region - quarter FE</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
</tbody>
</table>

| N                    | 12,285 |

Sample: 28 years old and older, on resvn the entire sample
Local finance or economic opportunity?

PL280 does not affect financial health of individuals born before law

<table>
<thead>
<tr>
<th></th>
<th>dep var = riskscore</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>tribal court</td>
<td>-1.446</td>
</tr>
<tr>
<td></td>
<td>(4.95)</td>
</tr>
<tr>
<td>date quarter FE</td>
<td>x</td>
</tr>
<tr>
<td>tract employment rate (Z)</td>
<td>x</td>
</tr>
<tr>
<td>median tract income (Z)</td>
<td>x</td>
</tr>
<tr>
<td>Census region FE</td>
<td>x</td>
</tr>
<tr>
<td>N</td>
<td>175,970</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.069</td>
</tr>
</tbody>
</table>

Sample: consumers born between 1930 and 1953
Local finance or economic opportunity?
Summary of evidence on the effects of growing up without finance.

- **Slower credit market entry.**
  - Robust to including region FE.
  - Attenuated by bank branching expansion.
  - Lower supply ratio, conditional on demand.

- **Persistent effects on movers.**
  - Robust and stable upon including first Census tract FE.
  - Similar borrower qualities (delinquencies in the long run).
  - Long-run effects eventually converge.

- **Worse long-run financial health (on res entire sample).**
  - Robust and stable upon including region × quarter FE.
  - Robust and stable upon including median tract income.
  - Not robust to controlling for branches/population.

- **No effect on population born before PL280.**
Local finance or economic opportunity?
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- **No effect on population born before PL280.**
Conclusion

- Credible evidence on exposure to local finance using financial development arising from historical accidents
  - financial development improves financial health.

- Broader implications:
  - local finance *still* has considerable value.
  - policies to bring finance to underserved populations can be effective.
  - supply frictions are also important.
Reservation economies prior to PL280

Are state jurisdiction and tribal court rsvns similar pre-PL280?

- 1950 U.S. Census
- 1952 edition of Polk’s Bank Directory
  - hand transcribe, build area-specific measures of banking activity
Reservation economies prior to PL280

State and tribal court resvns were similar prior to PL280

<table>
<thead>
<tr>
<th>Conditions prior the passage of PL280</th>
<th>State Courts</th>
<th>Tribal Courts</th>
<th>Difference</th>
<th>p-value</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>bank branches per capita (×1000)</td>
<td>0.0248</td>
<td>0.0313</td>
<td>-0.0065</td>
<td>0.579</td>
<td>county</td>
</tr>
<tr>
<td>bank loans per capita</td>
<td>201.1</td>
<td>191.8</td>
<td>9.29</td>
<td>0.909</td>
<td>county</td>
</tr>
<tr>
<td>bank assets per capita</td>
<td>614.2</td>
<td>596.7</td>
<td>17.51</td>
<td>0.942</td>
<td>county</td>
</tr>
<tr>
<td>credit per capita from customary lenders (2008$)</td>
<td>263</td>
<td>648</td>
<td>-385</td>
<td>–</td>
<td>BIA area</td>
</tr>
<tr>
<td>per capita income (2008$)</td>
<td>2.640</td>
<td>2.678</td>
<td>-38</td>
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</tr>
<tr>
<td>family incomes (decile rank)</td>
<td>5.85</td>
<td>5.81</td>
<td>0.04</td>
<td>0.887</td>
<td>county</td>
</tr>
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<td>0.0601</td>
<td>-0.00053</td>
<td>0.948</td>
<td>county</td>
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</tbody>
</table>

Banking development present-day

<table>
<thead>
<tr>
<th>Outcome measure</th>
<th>Finding</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>indicator for any lending</td>
<td>banks significantly more likely to originate loans to resvns w/ state courts</td>
<td>bank-county</td>
</tr>
<tr>
<td>log(1+ bank branches per capita)</td>
<td>banking density 20% greater on resvns w/ state courts</td>
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