FINANCIAL FACTORS IN REGIONAL POVERTY AND INEQUALITY

An analysis using county-level US banking data

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MANY THANKS to Eric Breitenstein and his colleagues at the Federal Deposit Insurance Corporation for support with their data
Our starting point

Austin-Glaeser-Summers: “Jobs for the Heartland: Place-Based Policies in 21th Century America”; Brookings Papers 2018

They make three main points:

1. They show evidence of growing spatial divergence in the US
2. They suggest there is a case for space-based policies (the case is based on spatial externalities)
3. They advance some suggestions of what such policies can be: employment subsidies, job counselling, education

Here and in the rest of this literature: financial factors are not considered
Different research strands

1. Finance and growth (Levine, 2005, Handbook of Economic Growth)
2. Finance and inequality (Demirgüç-Kunt and Levine, NBER WP 2009)
3. Banks, lending relationships and monetary transmission (Pedersen and Rajan, JF 1994; Kashyap and Stein, AER 2000)

Some implications

1. Financial development increases growth and reduces poverty and inequality
2. Smaller banks tend to establish lending relations which protect firms from adverse shocks, hence promoting sustainable economic growth
3. Banks with stronger balance sheets are able to perform this function better
Major political agendas

In the US:
1. Regulatory relief for community banks

In Europe:
1. "Small banking box" (Germany)
2. Lighter regulation for cooperative banking sector (Italy)
We focus on four questions

*General question:*

1. Is there a link between banking conditions (structure, performance) and economic conditions (poverty, inequality, etc.) at local level?

*Specifically:*

2. Is there a causal link? (banks driving economic conditions)
3. Does bank performance (profitability, asset quality) affect local economic conditions?
4. Does the banking population structure (community banks) matter?
50 states, 3142 counties

Wide economic and labor market disparities within states
(E. Moretti, The New Geography of Jobs, 2013)
Geographical breakdown is critical

1. State-level analysis (50 states) is not sufficient
2. County-level analysis (3142 counties) seems adequate
3. However, banking data at county level do not exist

FDIC data

1. Balance sheets indicators: detailed quarterly data for all US banks
2. Deposits: annual data on deposit location at each bank branch
Our strategy

Use deposit location to estimate bank balance sheet indicators at county level.

Caveats

Critical assumption: deposit location is a good proxy of bank asset allocation (we follow Avery-Samolyk, JFSR 2004)

This assumption is probably valid for most small-medium banks, less as bank size grows (see Jagtiani-Maingi, FRB Philadelphia 2018)

Anyway, there is no better way to do it, given existing banking statistics
Constructing the data

Suppose two banks (1, 2) operating in two counties (A, B). **Green** are known variables, **red** unknown ones.

Two different FDIC data sources:
1) **Summary of Deposits** (annual) gives deposits of each bank in each county ($D_{1,A}, D_{1,B}, D_{2,A}, D_{2,B}$);
2) **Call Report Data** (quarterly) gives asset totals for each bank ($A_1, A_2$).

**STEP 1:** Assume each bank splits assets in the two counties in the same proportion as deposits:

\[
\frac{A_{1,A}}{D_{1,A}} = \frac{A_{1,B}}{D_{1,B}}; \quad \frac{A_{2,A}}{D_{2,A}} = \frac{A_{2,B}}{D_{2,B}}; \quad A_{1,A} + A_{1,B} = A_1; \quad A_{2,A} + A_{2,B} = A_2
\]

Solve for $A_{1,A}, A_{1,B}, A_{2,A}, A_{2,B}$.

**STEP 2:** Use asset estimates to calculate banking indicators as county averages weighted by market shares.

This is done for 3000+ counties and 5000+ banks.

We need two steps because deposit/asset ratios differ widely across banks, hence market shares cannot be calculated directly from deposits.
Our work so far


2. In this seminar we show descriptive charts for 2019 (the last pre-Covid year) + some preliminary static panel estimates

3. Future work:
   a. Extend the time dimension (2000-today)
   b. Dynamic panels with full set of controls
   c. Exogeneity analysis
   d. Covid effects
<table>
<thead>
<tr>
<th>Variable</th>
<th>mean</th>
<th>sd</th>
<th>min</th>
<th>p25</th>
<th>p50</th>
<th>p75</th>
<th>max</th>
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</thead>
<tbody>
<tr>
<td>No. of banks in operation</td>
<td>8.2</td>
<td>8.3</td>
<td>1.0</td>
<td>3.0</td>
<td>6.0</td>
<td>10.0</td>
<td>104.0</td>
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<tr>
<td>No. of counties a bank operates</td>
<td>58.0</td>
<td>124.8</td>
<td>1.0</td>
<td>2.0</td>
<td>6.0</td>
<td>41.0</td>
<td>870.0</td>
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<td>Share of the largest bank's asset (%)</td>
<td>44.2</td>
<td>20.7</td>
<td>11.5</td>
<td>28.7</td>
<td>39.5</td>
<td>54.1</td>
<td>100.0</td>
</tr>
<tr>
<td>Share of community banks' assets (%)</td>
<td>55.8</td>
<td>34.8</td>
<td>0.0</td>
<td>23.5</td>
<td>58.5</td>
<td>89.9</td>
<td>100.0</td>
</tr>
<tr>
<td>Share of top 5 US banks by assets (%) (*)</td>
<td>11.3</td>
<td>17.9</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>17.6</td>
<td>100.0</td>
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<tr>
<td>Common Equity Tier 1 Ratio (%)</td>
<td>10.7</td>
<td>1.6</td>
<td>3.8</td>
<td>9.7</td>
<td>10.4</td>
<td>11.3</td>
<td>25.7</td>
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<tr>
<td>Efficiency Ratio (%) (**)</td>
<td>61.9</td>
<td>6.5</td>
<td>21.2</td>
<td>57.9</td>
<td>61.4</td>
<td>65.4</td>
<td>116.6</td>
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<tr>
<td>Bank Pretax ROA (%)</td>
<td>1.5</td>
<td>0.5</td>
<td>-3.9</td>
<td>1.3</td>
<td>1.5</td>
<td>1.7</td>
<td>24.0</td>
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<tr>
<td>Nonperforming assets as a percent of total assets (%)</td>
<td>0.7</td>
<td>0.6</td>
<td>0.0</td>
<td>0.5</td>
<td>0.6</td>
<td>0.8</td>
<td>10.4</td>
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<tr>
<td>Net Interest Margin (%)</td>
<td>3.7</td>
<td>0.6</td>
<td>1.1</td>
<td>3.4</td>
<td>3.7</td>
<td>3.9</td>
<td>18.8</td>
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<tr>
<td>Noninterest income as a percent of total assets (%)</td>
<td>1.0</td>
<td>0.8</td>
<td>-0.1</td>
<td>0.7</td>
<td>1.0</td>
<td>1.3</td>
<td>29.0</td>
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<tr>
<td>Share of agricultural loans to total loans (%)</td>
<td>5.7</td>
<td>9.1</td>
<td>0.0</td>
<td>0.3</td>
<td>1.5</td>
<td>7.0</td>
<td>75.4</td>
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<tr>
<td>Share of C&amp;I loans (under $1 mil) to total loans (%)</td>
<td>6.1</td>
<td>3.0</td>
<td>0.2</td>
<td>4.0</td>
<td>5.5</td>
<td>7.3</td>
<td>29.5</td>
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<tr>
<td>Share of real estate loans to total loans (%)</td>
<td>64.2</td>
<td>11.3</td>
<td>3.7</td>
<td>56.8</td>
<td>64.7</td>
<td>72.3</td>
<td>91.9</td>
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<td>Total bank asset/population (Current $, Thou.)</td>
<td>31.0</td>
<td>125.5</td>
<td>1.1</td>
<td>16.6</td>
<td>22.7</td>
<td>32.7</td>
<td>6664.0</td>
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<tr>
<td>Bank assets/GDP (%)</td>
<td>63.8</td>
<td>124.9</td>
<td>0.8</td>
<td>41.5</td>
<td>56.2</td>
<td>73.8</td>
<td>6463.4</td>
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<tr>
<td>GDP per capita (Current $, Thou.)</td>
<td>52.1</td>
<td>71.8</td>
<td>6.9</td>
<td>32.0</td>
<td>43.0</td>
<td>57.0</td>
<td>2201.6</td>
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<tr>
<td>Unemployment rate (%)</td>
<td>4.0</td>
<td>1.4</td>
<td>1.4</td>
<td>3.0</td>
<td>3.7</td>
<td>4.6</td>
<td>18.3</td>
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<tr>
<td>Nonworking ratio (%) (***</td>
<td>18.5</td>
<td>14.1</td>
<td>-105.6</td>
<td>10.5</td>
<td>18.7</td>
<td>26.9</td>
<td>73.9</td>
</tr>
<tr>
<td>Share of population in poverty (%)</td>
<td>14.4</td>
<td>5.7</td>
<td>2.7</td>
<td>10.4</td>
<td>13.4</td>
<td>17.4</td>
<td>47.7</td>
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<tr>
<td>Share of population under 18 in poverty (%)</td>
<td>19.9</td>
<td>8.4</td>
<td>2.4</td>
<td>13.7</td>
<td>18.7</td>
<td>24.9</td>
<td>63.4</td>
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<tr>
<td>Personal income per capita (Current $, Thou.)</td>
<td>45.9</td>
<td>13.2</td>
<td>19.5</td>
<td>37.9</td>
<td>43.4</td>
<td>50.6</td>
<td>229.8</td>
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<tr>
<td>Household median income (real $, Thou.)</td>
<td>55.6</td>
<td>14.2</td>
<td>24.7</td>
<td>46.3</td>
<td>53.4</td>
<td>61.8</td>
<td>151.8</td>
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</tbody>
</table>

Note:

(**) Efficiency ratio is noninterest expense less amortization of intangible assets as a percent of net interest income plus noninterest income.
(*** ) Nonworking ratio = (1-no. of employed persons/no. of working age population) x 100. Working age here is defined as 20-64 years. A negative value in some counties is due to the fact that there are employed persons outside the working age.
Bank intensity I: n. of banks per county

Figure 1 Number of banks (2019)

Figure 2 Number of banks (2005 vs. 2019)
Bank intensity II: bank assets/GDP
Community Bank assets/all bank assets
“Big 5” assets/all bank assets
Leverage ratio

Figure 8 Leverage ratio (2019)

Figure 9 Leverage ratio (2005 vs. 2019)
Return on Assets
Net interest margin/assets

Figure 18 Net interest margin as ratio of assets (2019)

Figure 19 Net interest margin as ratio of assets (2005 vs. 2019)
Non-Performing Loan ratio

Figure 14 NPL ratio (2019)

Figure 15 NPL ratio (2005 vs. 2019)
Unemployment rate
Not-working ratio (1-Employed/Working Age Pop.)
## Panel estimates

### Fixed-effect estimation

<table>
<thead>
<tr>
<th>RHS variables</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
<th>(9)</th>
<th>(10)</th>
<th>(11)</th>
<th>(12)</th>
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</thead>
<tbody>
<tr>
<td>Share of community banks' assets (%)</td>
<td>0.002*** (0.001)</td>
<td>0.002* (0.001)</td>
<td>0.001 (0.001)</td>
<td>-0.000 (0.001)</td>
<td>0.001 (0.007)</td>
<td>-0.000 (0.007)</td>
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<td>Bank Pretax ROA (%)</td>
<td>-0.461*** (0.075)</td>
<td>-0.184*** (0.048)</td>
<td>-0.265*** (0.046)</td>
<td>-0.104* (0.046)</td>
<td>-0.390*** (0.126)</td>
<td>-0.103 (0.131)</td>
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<td>Nonperforming assets as a percent of total assets (%)</td>
<td>0.394*** (0.024)</td>
<td>0.340*** (0.028)</td>
<td>0.179*** (0.020)</td>
<td>0.148*** (0.024)</td>
<td>0.395*** (0.064)</td>
<td>0.365*** (0.072)</td>
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<td>2005 dummy</td>
<td>1.112*** (0.023)</td>
<td>1.173*** (0.023)</td>
<td>1.154*** (0.023)</td>
<td>1.174*** (0.023)</td>
<td>1.695*** (0.090)</td>
<td>1.748*** (0.091)</td>
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<td>2010 dummy</td>
<td>5.003*** (0.045)</td>
<td>4.593*** (0.080)</td>
<td>4.081*** (0.067)</td>
<td>4.045*** (0.066)</td>
<td>1.451*** (0.042)</td>
<td>1.181*** (0.060)</td>
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<td>2018 dummy</td>
<td>-0.256*** (0.018)</td>
<td>-0.297*** (0.021)</td>
<td>-0.275*** (0.019)</td>
<td>-0.285*** (0.019)</td>
<td>-0.177*** (0.041)</td>
<td>-0.235*** (0.042)</td>
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<tr>
<td>2019 dummy</td>
<td>-0.376*** (0.019)</td>
<td>-0.427*** (0.022)</td>
<td>-0.384*** (0.020)</td>
<td>-0.398*** (0.020)</td>
<td>-0.866*** (0.042)</td>
<td>-0.928*** (0.043)</td>
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<tr>
<td>constant</td>
<td>4.231*** (0.052)</td>
<td>5.113*** (0.124)</td>
<td>4.092*** (0.024)</td>
<td>4.327*** (0.106)</td>
<td>15.256*** (0.088)</td>
<td>15.768*** (0.083)</td>
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<td>N</td>
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</tr>
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</table>

Standard errors in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Standard errors are robust to heterogeneity and serial correlation and clustered at the county level
Interpreting the coefficients (*)

One standard deviation increase of NPL ratio (from 0.7% to 1.3%) is associated with an increase of the unemployment rate of 0.2 \((sample \ mean = 4.0)\), or about 500,000 people.

One standard deviation decrease of RoA (from 1.5% to 2%) is associated with an increase of the unemployment rate of 0.1 \((sample \ mean = 4.0)\), or about 250,000 people.

One standard deviation increase of NPL ratio (from 0.7% to 1.3%) is associated with an increase of the poverty rate of 0.1 \((sample \ mean = 14.4)\), or about 280,000 people.

One standard deviation increase of NPL ratio (from 0.7% to 1.3%) is associated with an increase of the non-working rate of 0.2 \((sample \ mean = 18.5)\), or about 420,000 people.

(*) We consider coefficients significant at 0.1% from columns 4, 8 and 12 in table of the preceding slide.
Tentative conclusions

1. Lots of interesting data ... lots of work still to do ...

2. There is a clear association at local level between banking conditions and economic conditions. Stronger banks are clearly associated with better economic conditions

3. Causality could go both ways. We cannot infer causality yet. Exogeneity issues and instrumental var. is next step

4. We find no relationship between local economic conditions and the intensity of CB presence