Agrarian Structure and Endogenous Financial Development

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Why does financial depth differ across countries?

- Legal origins
  - La Porta, Lopez-de-Silanes, Shleifer, Vishny (1997, 1998)
  - Inherent differences in creditor/shareholder rights

- “Flexible” explanations
  - Rajan and Zingales (2003): variation based on trade
  - Musacchio (2008): variation w/in Brazil
  - Haber, North, Weingast (2008): political conflict
This study

- Land distribution is meaningful explanation of financial development
- Evidence
  - Historical examples from U.S., Latin America of opposition from land-owners
  - Cross-country evidence from 20th century
- Theory
  - OLG model of capital accumulation
  - Banking system necessary to translate savings to investment
  - Bank efficiency subject to political system
  - Banking system dynamically evolves, depending on land inequality and land endowment
Related Literature

- *Given* a market friction, inequality matters
  - Greenwood and Jovanovic (1990), Aghion and Bolton (1997)
  - Chakraborty and Ray (2005)

- This paper, the *friction* evolves based on inequality
Relationship of Land Inequality and Bank Credit

Graph showing the relationship between Land Gini and Bank Credit/GDP, with OLS fits for the whole sample and excluding OECD countries.
Identification of the Relationship

- Look to Engerman/Sokoloff hypothesis
- Geographic conditions $\Rightarrow$ land distribution
- Sugar and wheat production potential as instruments
- Rajan and Ramcharan (2008) - U.S. financial development and inequality
## Bank Credit and Inequality

### Dep. Var. is Bank Credit/GDP (80-95)

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<th>(1)</th>
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<tbody>
<tr>
<td>Land Gini</td>
<td>-2.455***</td>
<td>-2.263***</td>
<td>-1.116**</td>
<td>-0.744</td>
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<tr>
<td></td>
<td>(0.607)</td>
<td>(0.741)</td>
<td>(0.496)</td>
<td>(0.489)</td>
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<tr>
<td>Legal Origins</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Inst. and Fract.</td>
<td>Yes</td>
<td>Yes</td>
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<td>Bank Efficiency</td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
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<tr>
<td>(Net interest margin and overhead costs)</td>
<td></td>
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<tr>
<td>Sargan p-value</td>
<td>0.371</td>
<td>0.438</td>
<td>0.663</td>
<td>0.205</td>
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<tr>
<td>1st stage F-stat</td>
<td>19.32</td>
<td>11.96</td>
<td>8.61</td>
<td>7.69</td>
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</tbody>
</table>

All regressions use 2SLS with 54 observations
Implications

- One standard deviation increase in Gini $\Rightarrow$ 10% decline in Credit / GDP
- Robust to institutional differences, legal origins, income inequality
- Works through efficiency of the financial system
Main Elements

- Over-lapping generations - work in 1st, save for 2nd
- Utility is such that savings are iso-elastic to return on savings
- First period - work, earn rent, earn bank profits, set the number of banks for old generation
- Second period - earn return on savings, given number of banks set by younger generation
- Production has two sectors, but homogenous output
- Land is untraded - handed down within dynasties
Introduction

Evidence

Theory

Conclusion

Banking System

- $B$ banks compete for deposits, but understand that supply of deposits depends on rate of return
- Cournot competition $\Rightarrow$ Nash Equil.
- Return to savings $r$ are marked down from MPK $R$

$$1 + r_t = \frac{B}{\upsilon + B} (1 + R_t)$$

- $1/\upsilon$ is the elasticity of savings wrt rate of return
- $B$ dictates efficiency of the financial sector
Individual Optimization

- Individual income is

\[ y_{it} = w_t + \theta_i X \rho_t + \gamma_i \Pi_t \]  \hspace{1cm} (2)

- This can be written as

\[ y_{it} = w_t (1 - \theta_i N (1 - q_t)) + \theta_i Y_{At} + \gamma_i \Pi_t \]  \hspace{1cm} (3)

- \( w_t \) are wages, \( \rho_t \) is rent, \( X \) is total land, \( \Pi_t \) are total bank profits, \( Y_{At} \) is total ag. output, \( N \) is population
- \( \theta_i \) is individual’s share of land
- \( \gamma_i \) is individual’s share of bank profits
Maximizing the individual’s income over the number of banks:

\[
\frac{\partial w_t}{\partial B_t} (1 - \theta_i N(1 - q_t)) + \gamma_i \frac{\partial \Pi_t}{\partial B_t} = 0 \quad (4)
\]

- Individual supplies one unit of labor
- Individual demands \( \theta_i N(1 - q_t) \) units of labor
- Compare supply and demand to find net effect of wages on income
- Marginal effect of banks on wages has to equal marginal effect of banks on profits
- As economy develops (\( q_t \) increases) so does support for banks
Individual Optimal Bank Choice and Industrial Share
Dynamic Implications

- Given a number of banks, $B_t$, the dynamics of $K_t$ are given.
- Given $K_t$, individuals have optimal choices of $B_t$ given their endowments.
- Political system determines the actual $B_t$ chosen.
- Combine $K_t$ dynamics with $B_t$ to find steady state.
Steady State with a Single Elite Group

\[ B_{\text{max}} \]

\[ K_{\text{ss}}(B) \]

High inequality
Low inequality

\[ B(\lambda') \]

\[ B(\lambda'') \]
Conclusions

- Findings
  - Land inequality adversely affects financial development
  - This adverse effect works through efficiency
  - Historically, this is done by limiting number of banks

- Explanation
  - OLG model of savings with explicit banking sector
  - Incentives of individuals vary on efficiency of banking
  - Land-holders resist efficiency to preserve rents
  - Allows for dynamic change in incentives and endogenous development of financial sector