FINANCIAL INTERMEDIATION AND OCCUPATIONAL CHOICE IN DEVELOPMENT

Author: Andrés Erosa

*Review of Economic Dynamics (2001)*

Presented by Lucila Berniell
Motivation: Costly financial intermediation and development

- **Financial intermediation** is much more costly in developing countries (4 times more than in rich countries).
- Two alternative measures of **intermediation costs (IC)** are negatively associated with **development**.
- **Taxes** on financial intermediation greatly contribute to the high IC.

![Graphs showing the relationship between GDP per capita and financial intermediation costs](image)
Motivation: Costly financial intermediation and entrepreneurship

- **Occupational choice** patterns are also associated with intermediation costs.

- The **higher** the IC, the **higher the share of entrepreneurs** in the economy.

- Entrepreneurship is positively associated with intermediation costs even after controlling for income per capita differences.
Motivation: Effects of costly financial intermediation

- **High taxes** on financial intermediaries ⇒ **High IC**.
- **Theoretical equivalence** of taxing capital income or financial intermediation.
- **This paper:** with **occupational choice** (OC) the equivalence fails:

⇒ *Individuals can avoid intermediation taxes by using their savings to operate their own businesses* (instead of buying financial assets and working for someone else.)

- Nontrivial effects of higher IC on saving decisions
  - ↓ the return on financial assets ⇒ ↓ savings,
  - some individuals may become entrepreneurs to avoid the low return on deposits ⇒ ↑ savings

- There are other effects of OC + IC on organization of production (entrepreneurship, business size, etc.).
Model: Individuals and production technology

- OLG that are born continuously at a constant rate and live for $T$ periods.
- Individuals of the same age are identical, and are endowed with 1 unit of time until they retire at age $R$.
- Preferences:
  \[
  \int_0^T \exp[-\rho s]u[c(t + s)]ds,
  \]
- At each $t$ individuals decide whether:
  - to work for a wage $w$, or
  - operate a technology $y = f(k, n)$, where $f(.)$ is well-behaved and exhibits DRS (entrepreneurs are the residual claimants).
- Single good. Capital depreciates at a rate $0 < \delta < 1$ when used in production.
Model: Banks

- All lending is intermediated.
- Interest rates on deposits is $i_d$, and interest rate on loans is $i_l$, where $i_d < i_l$.
- Banks spend resources $\phi$ for each unit of lending.
- Large number of banks (zero profits).
- Banks solve the following (static) problem

$$\max_{0 \leq l_b \leq d_b} i_l l_b - i_d d_b - \phi l_b.$$  

- Intermediation costs are such that $\phi = i_l - i_d$, and $l_b = d_b$.  

Individual’s decision problem

- Individuals save in: capital or deposits.
- They borrow to consume or to finance the capital used in business.
- Individuals’ balance sheet: $k + d \equiv l + a$.
- Focus on stationary equilibrium (constant prices) $\Rightarrow$ decision problem is independent of date of birth.

$$
\max_{c,k,n,d,l,a} \int_{0}^{T} \exp[-\rho s] u[c(s)] ds,
$$

s.t. 

$$
\dot{a} = e I_R[f(k,n) - wn] + (1 - e) I_R w + i d - i l - \delta k - c,
$$

$$
k + d = a + l,
$$

$$
I_R(s) = \begin{cases} 
1 & \text{if } s \leq R, \\
0 & \text{if } s > R.
\end{cases}
$$

$$
e \in \{0,1\}, \quad a(0) = 0, \quad a(T) \geq 0, \quad c, d, l, k, n \geq 0.
$$
Individual’s decision problem: occupational choice

- Income of a worker with assets $a$: $y_w(a) = w + i_d a$.

- Income if entrepreneur with assets $a$:
  
  $y_e(a) = \max_{k,n}\{f(k, n) - wn + i_d \max\{a - k, 0\} - i_d \max\{k - a, 0\} - \delta k\}$.

- Function $h(a) = y_e(a) - y_w(a)$. If $h(a) < 0$, individual chooses to be a worker ($e = 0$), or an entrepreneur otherwise ($e = 1$).
Who are the entrepreneurs? Those who save enough

Proposition 1

The individual's occupational choice is related to net worth according to

\[ e(s) = \begin{cases} 1 & \text{when } a(s) \geq a^*, \\ 0 & \text{when } a(s) < a^*, \end{cases} \]

for some constant \( a^* \).

Sketch of proof: \( h(a) \) is continuous, non-decreasing in \( a \), \( h(0) < 0 \), and \( h(a) \geq 0 \) for \( a \) high enough \( \Rightarrow a^* \) exists by the intermediate value thm.
Lifetime occupational choices

Proposition 2

Individuals’ lifetimes can be divided into at most three stages according to their occupational choice

\[ e(s) = \begin{cases} 
0 & \text{when } s \geq s_e \text{ and } s > s_w, \\
1 & \text{when } s_e \leq s \leq s_w, 
\end{cases} \]

for some ages \( s_e, s_w, \) and \( s \in [0, R] \).

- It is optimal to start as workers, switch to entrepreneurs at age \( s_e \), and then switch back to being workers at \( s_w \) (if worth is low enough, i.e., lower than \( a^* \)).

- Finite lives + consumption smoothing \( \Rightarrow \) net worth starts to decrease down to zero (at \( T \)).
Countries only differ in the efficiency (IC) of the financial system.

Intermediation costs differ across countries as documented in the motivation (spread=0.04 for rich and spread=0.15 for poor countries).

Parameters of preferences and prod. technology are selected so that for an **IC of 0.04** the **SS mimics** some dimensions of the **US** economy.

Two Experiments:

- **Experiment 1**: effects of different levels of IC.
- **Experiment 2**: Effects of taxing intermediaries or taxing capital income.
**Experiment 1:** What are the **quantitative** effects of **intermediation costs** on development?

**Table:** Spreads and Development

<table>
<thead>
<tr>
<th>Spread</th>
<th>0.04</th>
<th>0.08</th>
<th>0.15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output</td>
<td>1.39</td>
<td>1.19</td>
<td>1</td>
</tr>
<tr>
<td>Loans/output</td>
<td>2.7</td>
<td>2.2</td>
<td>1.6</td>
</tr>
<tr>
<td>Dep. interest rate ($i_d$)</td>
<td>2.4%</td>
<td>0.4%</td>
<td>-4.4%</td>
</tr>
<tr>
<td>Capital/output</td>
<td>3.3</td>
<td>3.0</td>
<td>2.7</td>
</tr>
<tr>
<td>Gini assets</td>
<td>0.37</td>
<td>0.43</td>
<td>0.53</td>
</tr>
</tbody>
</table>

**Table:** Number and Size of Businesses

<table>
<thead>
<tr>
<th>Spread</th>
<th>0.04</th>
<th>0.08</th>
<th>0.15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entrep./labor force</td>
<td>10%</td>
<td>13%</td>
<td>20%</td>
</tr>
<tr>
<td>Workers per business</td>
<td>10</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Capital per worker</td>
<td>1.5</td>
<td>1.2</td>
<td>1.0</td>
</tr>
<tr>
<td>Entrep. Equity/capital</td>
<td>18%</td>
<td>27%</td>
<td>35%</td>
</tr>
</tbody>
</table>
Effects of high IC on development

Distribution of assets: Age profiles and Lorenz curves.

- Higher IC $\Rightarrow$ savings are concentrated later in life.
- Higher IC $\Rightarrow$ savings are more concentrated across individuals.
**Experiment 2:** Can we do better by taxing activities other than financ. intermediation?

Compare two economies which only differ on taxes collected by governments (equal revenues):

- a fixed amount ($\phi$) per unit of value intermediated, or
- a proportional tax ($\tau$) on capital income.

<table>
<thead>
<tr>
<th></th>
<th>Intermediation tax ($\phi$)</th>
<th>Capital income tax ($\tau$)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.04</td>
<td>0.08</td>
</tr>
<tr>
<td>Output</td>
<td>55.6</td>
<td>47.5</td>
</tr>
<tr>
<td>Normalized output</td>
<td>1.39</td>
<td>1.19</td>
</tr>
<tr>
<td>Entrep./labor force</td>
<td>10.2%</td>
<td>13.5%</td>
</tr>
<tr>
<td>Capital per business</td>
<td>38.9</td>
<td>22.9</td>
</tr>
<tr>
<td>Workers per business</td>
<td>8.8</td>
<td>6.4</td>
</tr>
</tbody>
</table>
Conclusion

- **Facts:**
  - Intermediation costs are higher in less developed countries.
  - High IC are associated with a more entrepreneurship.

- IC distort resources allocation: they affect capital accumulation (as taxes on capital income) AND occupational choice decisions.

- Quantitative analysis: higher IC implies
  - \( \downarrow \) savings,
  - \( \uparrow \) number of entrepreneurs (small scale),
  - \( \uparrow \) self-financing,
  - \( \uparrow \) inequality in the distribution of assets.

- It’s better to tax capital income than financial intermediation: efficiency gains with distributive conflict (wealthier individuals prefer high IC).