Theory of Financial Development and Economic Growth

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- History tells us that freeing up resources from Sovereign powers, as it happened in the Netherlands, England and later on the U.S., led to:

- Accumulation of savings at "Banks".

- Today's class: Why accumulation of savings at financial institutions (such as banks) would improve economic growth?

- Using a theoretical economic model.

Financial Frictions

- In financial markets, the **direct contact** of an individual lender with an individual borrower is costly because of
    - Undiversifiable risk,
    - Asymmetric information.

- These imperfections are called as "financial frictions" in economics.

More details

1. Financial frictions constrain investment and suppress economic growth.

2. Financial institutions (such as banks and specialized lending contracts) emerge to overcome financial frictions

Theories of Financial Development

- We will go over 4 different theories of financial development.
1. **Cross-sectional risk: Greenwood and Jovanovic (1990).**
2. Selection of projects: King and Levine (1993)
3. Enforcing loan contracts: Banerjee and Newman (1993)
4. Liquidity risk: Bencivenga and Smith (1991)
- We will study the first one in detail.

Theories of Financial Development - II

- We will also study the potential counterproductive financial development policies:

1. Secondary markets and growth: Bencivenga, Smith, and Starr (1997).

2. Entrepreneurial heterogeneity and financial development: Uras (2012).

Goldsmith-McKinnon-Shaw hypothesis

- **Goldsmith (1968):**

- The financial superstructure of an economy accelerates economic growth and improves economic performance to the extent that it facilitates the migration of funds to the best user, i.e., the place in the economic system where the funds will yield the highest social return.

- Ratio of financial institutions assets to GDP rises with GDP for 6 countries, 1860- 1963.

Goldsmith (1968)
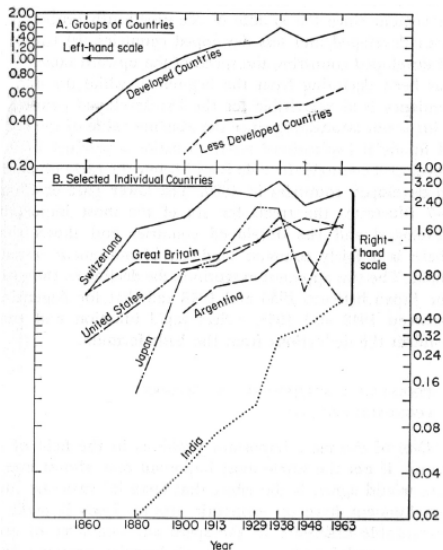
Empirical Evidence on Finance and Growth

- **Beck, Levine and Loayza (2000):**

- Private credit deepening in an economy stimulates:
  - Per-capita gdp growth
  - Productivity growth
  - Per-capita capital stock growth

Causality

- Direction of causation not easy to identify:

- Financial Development $\Rightarrow$ Economic Development?

- Economic Development $\Rightarrow$ Financial Development?

Kuznet's Curve

- **Income inequality increases during the early period of economic development, levels off during the intermediate stage, and declines in the final period.**

- Paukert (1993) and Barro (2000) provide cross-country empirical evidence for this development pattern.

- Historical Evidence:
    - British industrial revolution, 1760: Income in equality rose, and then leveled off. [Lindert and Williamson (1983)].
    - Information age, 1974: Income inequality rose. [Juhn, Murphy and Pierce (1993)].

Greenwood and Jovanovic Theory

- Focuses on the connection between growth, financial development and the distribution of income.

- **Growth $\Rightarrow$ Financial Development $\Rightarrow$ Growth**

- Institutions arise endogenously to facilitate trade:
  - Collect and analyze information,
  - Pool risk over a large number of traders.

Greenwood and Jovanovic Theory - II

Development Dynamics generated by Greenwood-Jovanovic model:

- **Early stage:** financial markets are virtually nonexistent and growth is slow.

- **Intermediate stage:** financial structure begins to form, both the growth and saving rates pick up, and the distribution of income widens.

- **Final stage:** saving rate falls, growth rate converges to higher and more stable level, and the distribution of income across individuals stabilizes.

Preferences and Technology

- **Preferences (Utility Function):**

$$E\left[\sum_{t=0}^{\infty} \beta^t \ln(c_t)\right]$$

- 2 types of one-period production projects: Risky, and Safe.
- **Risky Project:**

$$y_{it} = (\theta_t + \epsilon_{it})x_{it}$$

- x:investment, θ: aggregate shock, ϵ: idiosyncratic shock with $E[\epsilon] = 0$.
- The individual ca[??]ly observe the composite return from the project.
- **Safe Project:**

$$y_{it} = \delta x_{it}$$

- δ is deterministic.
- **Mean returns:**

$$1/\beta < \delta < E[\theta]$$

Capital Endowment

- Index people by a name on the unit interval, $j \in [0; 1]$.

- Each person on this interval has the previously specified preferences and access to production technologies.

- Furthermore, each person has k_j units of wealth that can be consumed or invested in production (safe or risky).

Competitive Intermediation

- $\mathcal{A}$: a set of agents joined together in a financial intermediary (a collection of names from the $[0, 1]$) interval.

- λ: The distribution over names who choose to join intermediary.

- α: The once-and-for-all cost associated with someone joining the intermediary (**Cost of Banking**).

- Individuals pool idiosyncratic projects.

- Not the capital endowment.

Competitive Intermediation - II

- How does the financial intermediary invest?

- Draw a **finite number of projects**, τ, from the portfolio of individual projects to **research aggregate productivity**.

- Fund each project with

$$\hat{k} = \int_A k_j d\lambda(j) / \int_A d\lambda(j)$$

Competitive Intermediation - III

- Calculate a test-statistic from this research sample

$$\hat{\theta}_\tau = \theta + \sum_{j=0}^{\tau} \epsilon_j / \tau$$

- Financial intermediary's investment:
  - If $\hat{\theta}_\tau > \delta$ then fund all the remaining projects with $\hat{k}$.
  - If $\hat{\theta}_\tau < \delta$ use safe technology only.

- Denote z as the return from this investment activity:
  - It is easy to show that as $\tau \to \infty$, $z \to \max(\delta, \theta)$.

- Repay $r(z)k_j$ to individual j who joined intermediary, where $r(z)$ is determined endogenously as a function of z.

Competitive Intermediation - IV

What are the benefits from financial intermediation?

- Produce information about the aggregate state of the economy (the research sample drawn).

- Pool cross-sectional risk.

Participation at Financial Intermediation

- Individuals must decide whether to join the intermediated sector or not:
  - If so, incur a once-and-for-all cost of α.
- Denote s as individual savings, return to an agent outside of the intermediated sector:

$$
\begin{aligned}
W(k) \;=\; & \max_s \{\ln(k-s) \\
& + \; \beta \int \max[W(s(\theta + \epsilon)), V(s(\theta + \epsilon) - \alpha)] dF(\theta) dG(\epsilon)\}
\end{aligned}
$$

- Return to an agent inside of the intermediated sector:

$$
\begin{aligned}
V(k) \;=\; & \max_s \{\ln(k-s) \\
& + \; \beta \int \max[W(s \max(\delta, \theta)), V(s \max(\delta, \theta))] dF(\theta)\}
\end{aligned}
$$

Participation at Financial Intermediation - II

- **Result 1.** $V(k) > W(k)$ for all k.

- Technical Insight: When the value function is concave it is better to be in the intermediated sector. You get a higher expected return and there is less risk.

- This result implies: Agents do not exit from the financial intermediary sector, which implies:

$$V(k) = \max_s \{\ln(k - s) + \beta \int V(s \max(\delta, \theta)) dF(\theta)\}$$

with a solution for the individual saving $s = \beta k$.

Participation at Financial Intermediation - III

- **Result 2.** There exists $\underline{k}$ and $\bar{k}$ with $0 < \underline{k} < \bar{k}$ such that:
  - $W(k) > V(k - \alpha)$ for $0 < k < \underline{k}$;
  - $W(k) < V(k - \alpha)$ for $k > \bar{k}$.

- At low levels of income $(k_j < \underline{k})$ it is hard to cover the fixed cost so an individual j is better off not participating in the intermediated sector.

- At some high enough income level $(k_j > \bar{k})$ the fixed cost is inconsequential and hence an individual j is better off in the intermediated sector.

Kuznet's Curve and Income Distribution

- The difference in relative wealth levels between members of the intermediated sector and the very poor widens over time.

Growth

- **Economic Growth:**
    - Poor country: $\beta E[\theta]$,
    - Rich country: $\beta E[\max(\delta, \theta)]$.

- Rich economies grow faster than poor countries.

- **Volatility:**
    - Poor country: $\beta^2 Var[\theta]$,
    - Rich country: $\beta^2 Var[\max(\delta, \theta)]$.

- Rich countries have lower volatility in their growth relative to very poor ones.

Summary of Greenwood-Jovanovic Findings

- A model is presented where growth and financial structure are inextricably linked:
  - Growth provides the wherewithal to implement financial structure.
  - Financial structure promotes growth.

- The model yields a development process consistent with casual empiricism.
  - Early stages of development: exchange is unorganized, and growth is slow.
  - As income levels rise, financial structure becomes more extensive, growth picks up and income inequality widens.
  - At high levels of development, exchange is organized and growth is faster.

Other Theories of Financial Development

Screening of Entrepreneurs

- **King and Levine (1993)**:

- A model where entrepreneurs have **ideas**, but **no resources**.

- Entrepreneurs undertake innovation to seek monopoly rents:
  Schumpeterian view of entrepreneurship.

- There is costly entrepreneurial screening (selection): Entrepreneurial
  skills have to be assessed.

Screening of Entrepreneurs - II

- Evaluation costs incurred by banks: By undertaking screening costs they search for the most promising entrepreneurs.

- **Total Factor Productivity** (TFP) of the economy depends on the quantity and quality of entrepreneurs that get financed.

- $\Rightarrow$ Banking development enhance TFP.

- Lowering screening costs (more efficient banks) increase growth through TFP growth: **Schumpeterian view of financial development**.

- Empirical evidence shows that financial systems are important for productivity growth.

Costly Enforcement

- **Banerjee and Newman (1993):**

- Explain the **process of economic development**.

- Due to **costly enforcement**: People can borrow only limited amounts from financiers.

- Therefore, occupations that require high levels of investment finance, are beyond the reach of poor people.

Costly Enforcement - II

- Low wealth individuals are **self-employed** or become **worker**, rich individuals become **firm-owners**.

- The pattern of occupational choice is therefore determined by the initial distribution of wealth.

- The structure of occupational choice in turn determines how much people save and what risks they bear.

- If the economy initially has few poor people and more rich people, it **takes off** and converges to a high state of economic development, otherwise it **stagnates**.

Liquidity Risk

- Large number of agents.

- Three time periods (0, 1 and 2); and one good. (A Diamond and Dybvig (1983) framework).

- Agents are born with a fixed endowment, and have access to
  - a **short**-term (unproductive),
  - and a **long**-term growth promoting (productive) investment opportunity.

- Agents face **random future liquidity needs**; and hence they cannot commit to long-term investment.

Liquidity Risk - II

- Banks can **pool liquidity risk** across the large number of agents,

- Reduce the socially inefficient liquidation of long-term investment, and

- Shift the composition of savings toward long-term investment capital and promote economic growth.

- We will study the Diamond and Dybvig (1983) framework in detail when we study banking fragility and contagion.

Does financial development always promote growth?

Growth Reducing Financial Development

- Pagano and Jappelli (1993)
  - Borrowing limits, if they constrain consumption, facilitate savings and stimulate economic development.

- Bencivenga, Smith and Starr (1997):
  - An increase in secondary market trading is not necessarily growth promoting because large secondary market volume could retard capital accumulation.

- Castro, Clementi and MacDonald (2004):
  - Too much risk-sharing might lower savings and reduce growth.

- Uras (2012):
  - Entrepreneurial heterogeneity determines the capacity to absorb long-term funds and the efficiency gains from financial development.

- **Next Class:** Measuring the real effects of financial frictions.

Readings

Required:

- **Greenwood, J., and Jovanovic, B., 1990. Financial Development, Growth, and the Distribution of Income, Journal of Political Economy, 98 (5), 1076-1107.**

Recommended:

- Banerjee, A., and Newman, A., 1993. Occupational Choice and the Process of Development, Journal of Political Economy, 101 (2), 274-298.
- Bencivenga, V., Smith, B., 1991. Financial Intermediation and Endogenous Growth, Review of Economic Studies, 58 (2).
- Bencivenga, V., Smith, B., Starr, R., 1997. Transaction Costs, Technological Choice, and Endogenous Growth, Journal of Economic Theory, 67, 153-177.
- King, R., Levine, R., 1993. Finance, entrepreneurship, and growth, Journal of Monetary Economics, 32.