

Banking

(Microeconomics of)

LECTURE 1

Alberto Zazzaro

Università di Napoli Federico II
CSEF and MoFiR

home page: <https://www.docenti.unina.it/alberto.zazzaro>

e-mail: alberto.zazzaro@unina.it

Outline

- 1 Market frictions and financial intermediation
- 2 Financial intermediation in the growth process
 - Theory
 - Empirical evidence
- 3 References

Market frictions, financial intermediary benefits and costs

Transaction costs and market incompleteness – *FIs stimulate capital accumulation*

- pooling saving
- diversifying risks
- producing liquidity

Ex ante and ex post information asymmetries – *FIs improve credit/capital allocation*

- producing information
- improving resource allocation (entrepreneurs, projects, innovation)
- exerting corporate governance

Financial versus real economy – *FIs lead to an over-financialization of the economy, worsening capital accumulation/allocation*

- inducing short termisms and increasing investment volatility
- increasing interconnections, financial fragility and risks of contagion
- shifting resources from real to financial sector

Do banks promote, follow or hamper economic growth?

- *"that financial markets contribute to economic growth is a proposition too obvious for serious discussion" (Robert Merton)*
- *"where enterprise leads finance follow" (Joan Robinson)*
- *"we are throwing more and more of our resources, including the cream of our youth, into financial activities remote from production of goods and services, into activities that generate huge private rewards disproportionate to their social productivity" (James Tobin)*

How do banks affect growth? A simple framework

- Assume that the economy produces a single good that can be consumed or invested to accumulate capital, which depreciate at an exogenous rate δ
- The aggregate output in the economy depends linearly on the aggregate capital stock, which increases over time due to investment (net of depreciation)

$$Y_t = AK_t$$

$$K_{t+1} = K_t(1 - \delta) + I_t$$

- In equilibrium, saving and investment are equal, but frictions in capital markets prevent all savings from reaching firms and turning into investments

$$S_t = sY_t$$

$$I_t = \phi S_t$$

- The economy's growth rate in $t + 1$ is

$$g_{t+1} = \frac{Y_{t+1} - Y_t}{Y_t} = \frac{K_{t+1}}{K_t} - 1$$

hence

$$g_{t+1} = (1 - \delta) + \frac{I_t}{K_t} - 1 = \frac{\phi s Y_t}{\frac{Y_t}{A}} - \delta = A\phi s - \delta$$

Two channels

- Financial systems affect growth by promoting or hampering
 - ① Physical/human capital accumulation
 - mobilization and pooling of savings; risk diversification $\Rightarrow \phi \uparrow$ and $S \uparrow$
 - financial fragility; propensity to consume $\Rightarrow \phi \downarrow$ and $S \downarrow$
 - ② Physical/human resource allocation and innovation
 - information production; screening and monitoring of firms/projects; corporate governance $\Rightarrow A \uparrow$
 - talent allocation $\Rightarrow A \downarrow$

Financial development and growth: The beginning

- Raymond Goldsmith (1969), *Financial Structure and Development*
- Using a sample of 35 countries from 1860 to 1963, Goldsmith shows that GDP and FIR *Financial Interrelation Ratio* – as measured by the ratio between financial assets in the economy and national wealth (physical assets plus the net foreign balance) – are positively correlated

Financial development and growth: Issues

Measuring Financial Development (FD)

- 1 DEPTH = Liquid liabilities of financial intermediaries/GDP
- 2 BANK = Deposit bank domestic credit/[deposit bank + central bank domestic credit]
- 3 PRIVATE = Bank credit to private sector/Total bank credit
- 4 PRIVY = Gross claims on the private sector/GDP
- 5 EFF = Average efficiency of domestic banks

Causality

- 1 Reverse causality: economic growth causes financial development
- 2 Omitted variables: unobserved factors that are correlated both with FD and GDP growth
- 3 Measurement errors: FD is not easy to define (is multidimensional) and measure

Channels

- 1 Capital accumulation
- 2 Capital allocation

Financial development and growth: modern approaches

- Cross-country/region studies

$$g_i^{t-T} = \alpha + \delta Y_{it} + \beta FD_{it} + \sum_{k=1}^n \gamma_k X_{it}^k + \epsilon_i$$

where g_i^{t-T} indicates the average GDP growth rate of country i in the period $t - T$, Y_{it} is the GDP per capita at the initial time to control for the convergence hypothesis, X^k include a number of growth determinants (human capital, infrastructures etc.) and FD_{it} is a measure of financial development at time t

$\beta = \partial g / \partial FD$ indicates the increase in growth rate for marginal increase of FD keeping constant the other explanatory variables

Endogeneity

Reverse causality

FD is affected by g and β only captures an anticipation effect

Omitted variables

Suppose that there is an unobserved variable z that affects g and is correlated with FD , such that

$$g_i = \alpha + \beta FD_i + \gamma z_i + \epsilon_i \quad \text{true effect} = \beta$$

$$z_i = a + b FD_i + \mu_i$$

$$g_i = (\alpha + \gamma a) + (\beta + \gamma b) FD_i + (\epsilon_i + \gamma \mu_i) \quad \text{estimated effect} = \beta + \gamma b$$

Measurement error

Financial development is observed and measured with an error $FD = TFD - e$

$$g_i = \alpha + \beta (TFD - e)_i + \epsilon_i$$

$$g_i = \alpha + \beta TFD_i + (\epsilon - \beta e)_i$$

TFD is correlated with the error term and β estimate is inconsistent (does not tend to the true impact of TFD on g)

Endogeneity: Instrumental Variable

- Find a variable Z (Instrumental variable) for which
 - ① $cov(Z, FD)$ is different from zero and strong
 - ② $cov(Z, g)$ is equal to zero except from the indirect effect through FD
- Three steps:
 - ① estimate: $FD_i = \alpha_1 + \beta_1 Z_i + \sum_{k=1}^n \gamma_{1k} X_{ik} + \gamma_i$
 - ② take the predicted values: $\hat{FD}_i = \hat{\alpha}_1 + \hat{\beta}_1 Z_i + \sum_{k=1}^n \hat{\gamma}_{1k} X_{ik}$
 - ③ estimate: $g_i = \alpha + \beta_{IV} \hat{FD}_i + \sum_{k=1}^n \gamma_k X_{ik} + \epsilon_i$
- It is possible to demonstrate that β_{IV} converges to the true β

Levine, Loayza and Beck (JME-2000)

- ① $FD_i = \alpha_1 + \beta_1 \text{Legal_Origin}_i + \sum_{k=1}^n \gamma_{1k} X_{ik} + \gamma_i$
- ② $\hat{FD}_i = \hat{\alpha}_1 + \hat{\beta}_1 \text{Legal_Origin}_i + \sum_{k=1}^n \hat{\gamma}_{1k} X_{ik}$
- ③ $g_i = \alpha + \beta_{IV} \hat{FD}_i + \sum_{k=1}^n \gamma_k X_{ik} + \epsilon_i$

Reverse causality: Industry/firm level studies

- 1 Degree of financial dependence by industry in the USA (Rajan and Zingales 1998)
 - test whether industries that are more dependent from external finance benefit disproportionately more from financial development than industries that are less dependent from external finance

$$g_{ij} = \alpha + \beta FD_i \times EFD_j + \lambda Share_{ij} + \sum_{i=1}^m \gamma_i C_i + \sum_{j=1}^n \delta_j I_j + \epsilon_{ij}$$

where i indicates country, j the industry, g_{ij} is the growth rate of value added in industry j and country i , C country fixed effects, I industry fixed effects, $Share_{ij}$ is the share of value added of industry j in country i , FD is a measure of financial development and ED is the dependence of industry j on external finance, where:

$EFD = (\text{capital expenditures} - \text{cash flow}) / (\text{capital expenditures})$ of U.S. firms in the industry j

Reverse causality: Industry/firm level studies II

- 2 Importance of small firms by industry in the USA (Beck, Demirguc-Kunt, Laeven and Levine 2008)
 - test whether industries that are "naturally" formed by a high share small firms (i.e., firms that are more dependent on bank credit) grow disproportionately faster in financially developed than in financially underdeveloped economies

$$g_{ij} = \alpha + \beta FD_i \times SSF_j + \lambda Share_{ij} + \sum_{i=1}^m \gamma_i C_i + \sum_{j=1}^n \delta_j I_j + \epsilon_{ij}$$

where i indicates country, j the industry, g_{ij} is the growth rate of value added in industry j and country i , C country fixed effects, I industry fixed effects, $Share_{ij}$ is the share of value added of industry j in country i , FD is a measure of financial development and SSF_j is the share of employment in small firms (less than 20 employees) in the industry j in the United States

Channels I

- ① Effects on physical capital accumulation and private saving rates (Beck, Levine and Loayza, JFE-2000)
 - Large and statistically significant effect of FD on real per capita GDP growth and total factor productivity growth
 - FD tends to be positively associated with physical capital accumulation and private saving rates, but results not robust to estimation techniques and FD measures

Channels II

- ② Investment in growing and declining industries (Wurgler, JFE-2000)
- these studies show that the elasticity of manufacturing investment to value added is stronger in financially developed than in financially underdeveloped economies

$$\ln \frac{I_{ijt}}{I_{ijt-1}} = \alpha_i + \eta_i \ln \frac{VA_{ijt}}{VA_{ijt-1}} + \epsilon_{ijt}$$

where η_i is the estimated elasticity of investment to value added in country i

$$\eta_i = \alpha + \beta_1 FD_i + \sum_{k=1}^n \gamma_k X_{ik} + \epsilon$$

where i indicates country, j the industry, X a number of growth determinants (GDP at the initial period, capital stock, human capital etc.), and FD is a measure of financial development

Evidence

After surveying the huge empirical literature on the finance-growth nexus, Ross Levine (2005) concludes that

- 1 countries with better functioning banks and financial markets grow faster
- 2 the causality goes from finance to growth
- 3 better functioning financial systems ease the external financing constraints that impede firms to invest and innovate

Evidence for Italy

- 1 Lucchetti, Papi and Zazzaro (2001) introduce a new indicator of banking system efficiency as the average efficiency of banks operating in a region weighted by the share of branches owned by each bank in that region
 - Italian regions whose banking system is populated by more efficient banks grow faster than other regions with inefficient banking system
- 2 Guiso, Sapienza and Zingales (2001) measure the financial (under)development at the provincial level as the estimated conditional probability of a household being rationed or discouraged from applying for credit
 - Financial development positively affect the provincial GDP growth rate, the entry of new firms and the probability of self-employment
- 3 Vaona and Patuelli (2008) find that the impact on growth is non-linear: the higher is the degree of local financial development, the weaker is its effect on growth

Too much or too little finance?

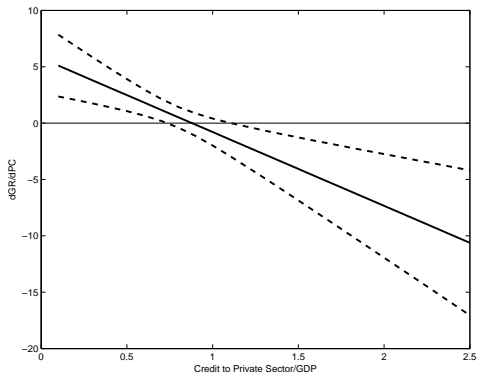
- 1 Financial depth has a **non-significant** impact on the rate of growth of **poor countries** and a **positive and significant** effect on the rate of growth of countries with **higher level of economic development** (Deidda and Fattouh, EL-2002)
- 2 Financial depth has **no impact** on the rate of growth of countries **at low level of financial depth**, a **positive and strong effects** for countries **at an intermediate level of financial depth**, a **positive and small effects** for countries **at a high level of financial depth** (Rioja and Valev, JdE-2004)
- 3 Countries **where financial sector grows much more rapidly than industrial sectors** the contribution of a further financial development to real GDP growth is **negative** (Ductor and Grechyna 2013)

Too much or too little finance?

- 4 The positive contribution of finance to economic growth has disappeared after the '90s (Rousseau and Wachtel, 2011)
- 5 In OECD countries financial development is negatively associated with GDP (Cournede and Denk, 2015) and financial development has no differential impact on the rate of growth of the industrial sectors that are more heavily dependent on external finance (Pagano and Pica, 2012)
- 6 There is a relationship between financial depth (the ratio between credit to the private sector and GDP) and the volatility of the growth of GDP which becomes positive when the former is equal to 1 (Easterly, Islam and Stiglitz, 2000)
- 7 The relationship between finance and growth becomes negative when financial depth reaches value between 0.9 and 1 (Cecchetti and Kharroubi, 2012; Law and Singh, 2014; Arcands et al., 2015)

Too much or too little finance?

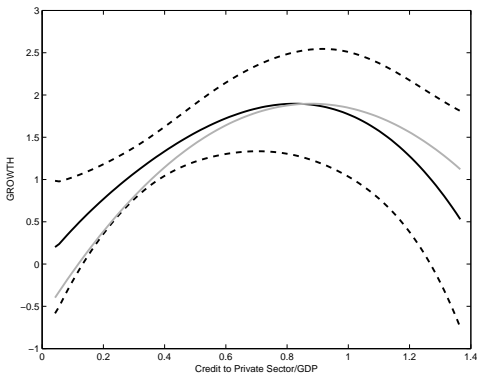
Figure 1. **Marginal Effect Using Cross-Country Data.** This figure plots the marginal effect of credit to the private sector on growth obtained from the regression of Table 1, column 6.



Source: Arcands, Berkes and Panizza (IMF-2012)

Too much or too little finance?

Figure 2. **Semi-Parametric Regressions.** The solid black line plots the relationship between credit to the private sector obtained by allowing credit to the private to take a generic functional form. The dotted lines are 90% confidence intervals and the light solid line plots the quadratic fit of columns 6, Table 1.



Source: Arcands, Berkes and Panizza (IMF-2012)

References

Levine R. (2005), Finance and growth: Theory and evidence, in *Handbook of the economic growth*, edited by P. Aghion and S. Durlauf, Amsterdam: Elsevier, vol. I, chapter 15