Financial Development and Economic Growth: A Review of Literature

Tridip Ray

Relationship between financial development and economic growth is a long-debated issue.

- Finance plays an important role in growth and development:
 - Walter Bagehot (1873)
 - Joseph Schumpeter (1912)
 - John Hicks (1969)
 - Merton Miller (1988)
- Joan Robinson (1952): " ... where enterprise leads finance follows."
- Robert Lucas (1988): Economists "badly overstress" the role of finance in economic growth.
- Nicholas Stern's (1989) survey of development economics does not even mention finance, not even in a section that lists 'omitted topics'.

- Levine, Ross (1997), "Financial Development and Economic Growth: Views and Agenda," *Journal of Economic Literature*, vol. 35, pp. 688-726.
- Levine, Ross (2003), "Finance and Growth: Theory, Evidence and Mechanisms," (forthcoming) *Handbook of Economic Growth* edited by Philippe Aghion and Steven Durlauf.

- Financial instruments, markets, and institutions arise to ameliorate the effects of information, enforcement, and transactions costs.
- How well financial systems reduce information, enforcement, and transactions costs influences
 - savings rates,
 - investment decisions,
 - technological innovations,
 - steady-state growth rates.
- Changes in economic activity can influence financial systems with dynamic implications for economic growth.

The financial sector does provide a real service.

- Empirical literature on finance and growth includes
 - cross-country growth regressions,
 - time-series analyses,
 - panel studies,
 - industry and firm level studies,
 - detailed country case-studies.
- Better functioning financial systems ease the external financing constraints that impede firm and industrial expansion.
 - This is one channel through which financial development matters for growth.
- Countries with better functioning banks and markets grow faster, but the degree to which a country is bank-based or market-based does not matter much.
 - Simultaneity bias does not seem to drive this conclusion.

What is financial development?

Financial development involves improvements in

- 1. producing information about possible investments and allocating capital,
- 2. monitoring firms and exerting corporate governance,
- 3. trading, diversification, and management of risk,
- 4. mobilization and pooling of savings,
- 5. easing the exchange of goods and services.
- These financial functions influence savings and investment decisions, and technological innovations and hence economic growth.

Producing Information and Allocating Capital

• Large costs associated with evaluating firms, managers, and market conditions.

– Individual savers may not have the ability to collect, process and produce information on possible investments.

– High information cost may prevent capital to flow to its highest value use.

• *Financial intermediaries* undertake the costly process of researching investment possibilities for others

 \Rightarrow reduced information costs \Rightarrow improved resource allocation \Rightarrow accelerated growth.

- Ramakrishnan and Thakor (1984);
- *Boyd and Prescott (1986);
- Allen (1990);
- *Greenwood and Jovanovic (1990);
- *King and Levine (1993);
- Kashyap, Stein and Rajan (1998).

... Producing Information

• *Stock markets* may stimulate the production of information about firms.

 As markets become larger and more liquid, agents have greater incentives to spend resources in researching firms.

- It is easier to profit from this information by trading in big and liquid markets.
- Grossman and Stiglitz (1980);
- Kyle (1984);
- Merton (1987);
- Holmstrom and Tirole (1993).
- Existing theories have not yet tightly assembled the links of the chain:

stock market liquidity \rightarrow information acquisition \rightarrow long-run economic growth.

Monitoring Firms and Exerting Corporate Governance

• Agency theory: Corporate governance problem: How equity and debt holders influence managers to act in the best interest of the providers of capital (Coase, 1937; Jensen and Meckling, 1976; Fama and Jensen, 1983; Myers and Majluf, 1984).

Absence of corporate governance enhancing financial arrangements

 \Rightarrow impedes savings mobilization from disparate agents

 \Rightarrow prevents capital to flow to profitable investments.

Equity holders exert corporate governance by

 directly voting on crucial issues like mergers, liquidation, changes in business strategy;

indirectly by electing the board of directors,
 writing managerial incentive contracts;

- takeover threats.

• Debate: Information asymmetries may keep diffuse shareholders from effectively exerting corporate governance (Shliefer and Vishny, 1997).

... Monitoring Firms

• An extensive literature demonstrates how *debt contracts* may arise to lower the costs of monitoring firm insiders (Townsend, 1979; Gale and Hellwig, 1985; Boyd and Smith, 1994).

– *Aghion, Dewatripont and Rey (1999) link the use of debt contracts to growth through adoption of new technologies.

• *Financial intermediaries* improve corporate governance.

Diamond (1984): The "delegated monitor" economizes on aggregate monitoring costs, eliminates the free rider problem as it does the monitoring for all the investors.

- *Bencivenga and Smith (1993): Intermediaries that improve corporate governance reduce credit rationing \Rightarrow higher productivity, capital accumulation and growth.

- *de la Fuente and Marin (1996): Intermediaries undertake the costly process of monitoring activities \Rightarrow improve credit allocation among competing technology producers \Rightarrow higher growth.

Risk Amelioration

Cross-sectional Risk Diversification

Financial systems mitigate the risks associated with individual projects, firms, industries, regions, countries.

- Banks, mutual funds, securities markets provide vehicles for trading, pooling and diversifying risk.
- Risk diversification \rightarrow savings rate \rightarrow resource allocation \rightarrow economic growth.
 - Savers do not like risk; but high-return projects are riskier;
 - Financial systems that ease risk diversification induce a portfolio shift towards higher return projects.
 - Gurley and Shaw (1955),
 - *Patrick (1966),
 - *Greenwood and Jovanovic (1990),
 - *Saint-Paul (1992),
 - *Devereux and Smith (1994),
 - *Obstfeld (1994),
 - *Acemoglu and Zilibotti (1997).

... Cross-sectional Risk Diversification

• Greenwood and Jovanovic (1990):

– Captures the link between *risk-sharing*, capital accumulation and growth.

Points out: effective *information processing* (entrepreneurs / projects) induces higher growth.

– Captures the dynamic interaction between finance and growth.

- Intermediaries improve resource allocation and foster growth.
- \circ Growth \rightarrow more individuals can afford to join intermediaries \rightarrow improves efficiency of intermediaries.
- Acemoglu and Zilibotti (1997):
 - Captures the interaction between *riskdiversification*, capital accumulation and growth.

– Emphasizes endogenous risk generation in the growth process.

– Financial systems allow agents to hold a diversified portfolio of risky projects

 \rightarrow more investments in high-return projects;

 \rightarrow higher growth.

... Risk Amelioration

Intertemporal Risk Sharing

Risks that cannot be diversified at a particular point of time (e.g., macroeconomic shocks), can be diversified across generations.

• Allen and Gale (1997):

– Long-lived intermediaries can facilitate intergenerational risk sharing:

- invest with a long-run perspective;
- offer returns that are relatively low in boom times and high in slack times.

... Risk Amelioration

Liquidity Risk

Liquidity risk arises due to uncertainties associated with converting assets into a medium of exchange.

– Some high-return projects require a long-run commitment of capital.

- Savers dislike relinquishing control of savings for a long period.

 With liquid financial markets, savers can hold liquid assets – equity, bonds or demand deposits;

• Financial markets transform these instruments into long-term capital investments.

– Hicks (1969): Industrial revolution required a financial revolution.

• Diamond and Dybvig (1983):

– Savers choose between an illiquid, high-return project and a liquid, low-return project.

 A fraction of savers receive shocks, access their savings before illiquid project produces.

– Prohibitive information (verification) cost creates incentives for financial markets to emerge.

... Liquidity Risk

• *Levine (1991):

- Takes the Diamond-Dybvig set-up;

– Models the endogenous formation of equity markets; links this to a growth model.

• *Bencivenga, Smith and Starr (1995):

– Highlights the role of liquidity through trading costs.

– High-return, long-gestation technologies require ownership transfer in secondary securities market.

– Financial markets lower trading costs \rightarrow increase liquidity \rightarrow induce a shift to long-gestation, high-return technologies.

- *Bencivenga and Smith (1991):
 - Financial intermediaries eliminate liquidity risks
 - \rightarrow increase investment in high-return, illiquid assets
 - \rightarrow accelerate growth.

Mobilizing Savings

Mobilization is the costly process of agglomerating capital from disparate savers to investors. It involves

– overcoming the *transaction costs* of collecting savings from numerous individuals,

– overcoming the *information asymmetries* associated with making savers feel comfortable in relinquishing control of their savings.

• Savings mobilization through financial market:

– Multiple bilateral contracts between productive units raising capital and agents with surplus resources.

 Joint stock company: many individuals invest in one entity – the firm.

• Savings mobilization through intermediaries:

– Thousands of investors entrust their wealth to banks that invest in hundreds of firms.

 Better savings mobilization → increase capital accumulation → improve resource allocation → boost technological innovation and growth.

Facilitating Exchange

Financialarrangementsthatlowertransaction costs can promote specialization, technologicalinnovation and growth.

• *Greenwood and Smith (1997):

Models the connection between exchange, specialization and innovation.

– More specialization requires more transactions and each transaction is costly.

– Financial arrangements that lower transaction costs facilitate greater specialization.

– Feedback from productivity gains to financial market development:

- Fixed costs associated with establishing markets.
- Higher growth → higher per capita income
 → the fixed costs are less burdensome as a share of per capita income.
- Economic development spurs the development of financial markets.

Finance and Growth: Evidence

Cross-Country Growth Regressions

• Goldsmith (1969):

– Pioneering study to assess whether finance exerts a causal influence on growth.

– Data: 35 countries; 1860 – 1963 (when available); Value of financial intermediary assets divided by GNP.

– Findings:

(i) financial intermediary size relative to the size of the economy rises as countries develop;

(ii) documents (graphically) a positive correlation between fin dev and eco dev.

– Problems:

(i) only 35 countries;

(ii) does not systematically control for other factors influencing growth;

(iii) close association does not identify the direction of causality;

(iv) the measure of fin dev used may not accurately proxy for the functioning of financial system.

... Cross-Country Studies

King and Levine (QJE, 1993):

- 77 countries; 1960 1989.
- Systematically control for other factors affecting growth.
- Examine three growth indicators (averaged over 1960-89):
 - real per capita GDP growth,
 - growth in capital stock per person,
 - total productivity growth ("Solow residual").
- Construct additional measures of the level of financial development:

– DEPTH: liquid liabilities of financial system divided by GDP;

• Measures the size of fin intermediaries.

– BANK: bank credit divided by bank credit plus central bank domestic assets.

• Measures the degree to which the central bank versus commercial banks are allocating credit.

– PRIVY: credit to private enterprises divided by GDP.

... Cross-Country Studies

... King and Levine (QJE, 1993): Findings (Table 1):

- A strong positive relationship between each of the financial development indicators and the three growth indicators.
- Sizes of the coefficients are economically large:

 $-\uparrow$ DEPTH from the mean of the slowest growing quartile (0.2) to the mean of the fastest growing quartile (0.6) of countries

 \Rightarrow per capita growth rate \uparrow by 1% per year.

 Rise in DEPTH alone eliminates 20% of the growth difference between the slowest growing and the fastest growing quartile of countries.

• King and Levine (JME, 1993) confirms these findings using alternative econometric methods and robustness checks.

Depth	Bank	Privy
2.4**	3.2**	3.2**
(0.007)	(0.005)	(0.002)
0.50	0.50	0.52
2.2**	2.2**	2.5**
(0.006)	(0.008)	(0.007)
0.65	0.62	0.64
1.8**	2.6**	2.5**
(0.026)	(0.010)	(0.006)
0.42	0.43	0.44
	Depth 2.4** (0.007) 0.50 2.2** (0.006) 0.65 1.8** (0.026) 0.42	Depth Bank 2.4** 3.2** (0.007) (0.005) 0.50 0.50 2.2** 2.2** (0.006) (0.008) 0.65 0.62 1.8** 2.6** (0.026) (0.010) 0.42 0.43

 Table 1: Growth and Financial Intermediary Development, 1960-89

Source: King and Levine (1993b), Table VII

* significant at the 0.10 level, ** significant at the 0.05 level (p-values in parentheses) Observations: 77

Variable definitions: DEPTH = Liquid Liabilities/GDP BANK = Deposit bank domestic credit/[deposit bank domestic credit + central bank domestic credit PRIVY = Gross claims on the private sector / GDP Productivity Growth = Real per capita GDP growth - (0.3)*(Real per capita Capital growth)

Other explanatory variables included in each of the nine regression results reported above:

logarithm of initial income, logarithm of initial secondary school enrollment, ratio of government consumption expenditures to GDP, inflation rate, and ratio of exports plus imports to GDP.

Notes: King and Levine (1993b) define 2 percent growth as 0.02. For comparability with subsequent tables, we have redefined 2 percent growth as 2.00 and adjusted the coefficients by a factor of 100.

... Cross-Country Studies

- ... King and Levine (QJE, 1993): Predictability:
 - To examine whether finance simply follows growth, studies whether the value of financial development in 1960 *predicts* the three growth indicators over the next 30 years.
 - Findings (Table 2):

• Financial depth in 1960 is a good predictor of subsequent rates of economic growth, capital accumulation and productivity growth.

• Coefficients are economically large:

Bolivia: \uparrow DEPTH (1960) from 10% of GDP to 23% (mean for developing countries) \Rightarrow per capita GDP 13% larger in 1990.

King and Levine (QJE, 1993): Limitations:

- While shows that finance predicts growth, still do not formally deal with the issue of causality.
- While improves upon the measure of fin. dev., still focus on only one segment of the financial system, banks.

Table 2: Growth and Initial Financial Depth, 1960-89

Dependent Variable	Depth in 1960		
Real per Capita GDP Growth, 1960-89	2.8** (0.001)		
R ²	0.61		
Real per Capita Capital Growth, 1960-89	1.9** (0.001)		
R ²	0.63		
Productivity Growth, 1960-89 R ²	2.2** (0.001) 0.58		

Sources: King and Levine (1993b), Table VIII; and Levine (1997), Table 3

* significant at the 0.10 level, ** significant at the 0.05 level

(p-values in parentheses). Observations: 57

Variable definitions:

DEPTH = Liquid Liabilities/GDP

Productivity Growth = Real per capita GDP growth - (0.3)*(Real per capita Capital growth)

Other explanatory variables included in each of the regression results reported above:

logarithm of initial income, logarithm of initial secondary school enrollment, ratio of government consumption expert to GDP, inflation rate, and ratio of exports plus imports to GDP.

Notes: King and Levine (1993b) and Levine (1997) define 2 percent growth as 0.02. For comparability with subset tables, we have redefined 2 percent growth as 2.00 and adjusted the coefficients by a factor of 100.

Cross-Country Studies: Stock Markets

Levine and Zervos (1998):

- 42 countries; 1976 1993.
- Construct numerous measures of stock market development.

Example: Turnover ratio: total value of shares *traded* divided by the value of shares *listed* on stock exchanges.

– Reflects trading frictions and information that induces transactions.

U.S. & Japan: 0.5; Bangladesh, Chile, Egypt: 0.06.

• Findings (Table 3):

 Initial levels of stock market liquidity and banking development are positively and significantly correlated with future rates of economic growth, capital accumulation and productivity growth.

– No tension between bank-based and market-based systems; rather, stock markets provide different financial functions from the banks (*both* enter the growth regression significantly).

Bank Cradit		
Darik Creuit	Turnover	R^2
1.31** (0.022)	2.69** (0.005)	0.50
1.48** (0.025)	2.22** (0.024)	0.51
1.11** (0.020)	2.01** (0.029)	0.40
_	Вапк Credit 1.31** (0.022) 1.48** (0.025) 1.11** (0.020)	Bank Credit Turnover 1.31** 2.69** (0.022) (0.005) 1.48** 2.22** (0.025) (0.024) 1.11** 2.01** (0.020) (0.029)

Table 3: Stock Market and Bank Development Predict Growth, 1976-1993

Source: Levine and Zervos (1998), Table 3.

* significant at the 0.10 level, ** significant at the 0.05 level. (p-values in parentheses) Observations: 42 for the real per capita GDP growth regression and 41 for the others. *Variable definitions:*

Bank Credit = Bank credit to the private sector / GDP in 1976 or the closest date with data. Turnover = Value of the trades of domestic shares on domestic exchanges as a share of market capitalization of domestic shares in 1976 or the closest date with data.

Productivity Growth = Real per capita GDP growth - (0.3)*(Real per capita Capital growth) Other explanatory variables included in each of regression results reported above:

logarithm of initial income, logarithm of initial secondary school enrollment, ratio of government consumption expenditures to GDP, inflation rate, black market exchange rate premium, and frequency of revolutions and coups.

Notes: Levine and Zervos define 2 percent growth as 0.02. For comparability with subsequent tables, we have redefined 2 percent growth as 2.00 and adjusted the coefficients by a factor of 100.

... Cross-Country: Stock Markets

... Levine and Zervos (1998):

• Coefficients are large and economically significant:

– One-standard-deviation increase in initial stock market liquidity \Rightarrow per capita GDP 15% higher.

- One-standard-deviation increase in Bank Credit \Rightarrow per capita GDP 14% higher.

Together, per capita GDP almost 30% higher;
 productivity almost 25% higher.

- Link between stock markets, banks and growth runs robustly through productivity growth rather than physical capital accumulation.
- Stock market size (market capitalization / GDP) is *not* robustly correlated with growth, capital accumulation and productivity improvements.

– Simply listing on the stock exchange does not necessarily foster resource allocation.

Cross-Country Studies: Causality

To assess whether the finance-growth link is driven by simultaneity bias, one needs *instrumental variables* that

- explain cross-country differences in fin dev,

– are uncorrelated with growth beyond their link with fin dev.

• Levine (1998, 1999), Levine, Loyaza and Beck (2000) use the LLSV (1998) measures of *legal origin* as instruments:

 Whether a country's Commercial/Company laws derive from British, French, German or Scandinavian laws tradition.

 LLSV (1998): legal origin importantly shapes national laws concerning shareholder or creditor rights, and efficiency of law enforcement.

• LLSV (1998), Levine (1998, 1999) and Levine, Loyaza and Beck (2000):

 Trace the effects of legal origin to laws and enforcement and then to the development of financial systems;

- Legal systems obtained through imitation and colonization \Rightarrow legal origin variables are exogenous.

Levine, Loyaza and Beck (2000):

- 71 countries; 1960 1995.
- The strong link between fin dev and growth is *not* due to simultaneity bias:

 Very strong connection between the exogenous components of fin dev and long-run economic growth.

– Data do not reject Hansen's (1982) test of the over-identifying restrictions.

• Instrumental variable results also indicate an economically large impact of fin dev on growth.

Argentina: ↑ value of Private Credit from 19.5% of GDP to 25% (the mean for developing countries)
⇒ per capita GDP growth ↑ by 1% per year.

• This is large considering an average of 1.8% per capita GDP growth.

Industry Level Analyses

Rajan and Zingales (1998):

• Strategy:

 Industries that are "naturally heavy users" of external finance should benefit more from greater fin dev than industries that are not.

– Use data from the U.S. (assuming U.S. fin markets are relatively frictionless) to identify which industries are "naturally heavy users" of external finance.

– Test: Do these industries grow faster in economies with better developed financial systems?

- 36 industries, 42 countries; 1980-90.
- Findings (Table 6):

- Increase in fin dev disproportionately boosts the growth of industries that are "naturally heavy users" of external finance.

– Percentile of dependence:

machinery: 75th, beverages: 25th;

Percentile of stock market capitalization: Italy: 75th, Philippines: 25th;

Machinery should grow 1.3% faster than beverages in Italy compared to Philippines (actual diff: 3.4%).

Share _{i,k} of industry k in country i in 1980	External _k * Total Capitalization _i	External _k * Accounting Standards _i	R ²	Observations
-0.912 (0.246)	0.069 (0.023)		0.29	1217
-0.643 (0.204)		0.155 (0.034)	0.35	1067

Dependent Variable: Growth of value added of industry k in country i, 1980-1990

Notes:

Source: Rajan and Zingales (1998), Table 4.

The table above reports the results from the regression:

 $Growth_{i,k} = \sum \alpha_j Country_j + \sum \beta_i Industry_i + \gamma Share_{i,k} + \delta_1 (External_k * FD_i) + \varepsilon_{i,k}$

Two regressions are reported corresponding to two values of FD_i, Total Capitalization and Account Standards respectively.

(Heteroskedasticity robust standard errors are reported in parentheses.)

External_k is the fraction of capital expenditures not financed with internal funds for U.S. firms in industry k between 1980-90.

Total Capitalization is stock market capitalization plus domestic credit.

Accounting Standards is an index of the quality of corporate financial reports.

Wurgler (2000):

- Industry-level data ; 65 countries; 1963-95.
- Computes an investment elasticity that gauges the extent to which a country
 - increases investment in growing industries,
 - decreases investment in declining industries.
 - It directly measures the degree to which financial system reallocates flow of credit.
- Finds that countries with higher levels of fin dev
 - increase investment more in growing industries,
 - decrease investment more in declining industries
 - than financially underdeveloped economies.

Firm Level Analyses

Demirguc-Kunt and Maksimovic (1998):

• Examines whether fin dev influences the degree to which firms are constrained from investing in profitable growth opportunities.

– Focus on long-term debt and external equity in funding firm growth.

- Firm-level data; 26 countries; 1980-91.
- Findings (Table 7):
 - Both banking system development and stock market liquidity are positively associated with the excess growth of firms.

– As in Levine and Zervos (1998), size of the stock market is *not* related to firm growth.

• Beck, Demirguc-Kunt, Levine and Maksimovic (2001) confirm the findings using an extended sample.

Dependent Variable: Proportion of firms that grow faster than their predicted growth rate¹

Market Capitalization/GDP	Turnover	Bank Assets/GDP	Adj. R ²	Countries	
-0.106 (0.058)	0.311*** (0.072)	0.162*** (0.050)	0.48	26	

Notes:

Source: Demirguc-Kunt and Maksimovic (1998), Table V

(White's heteroskedasticity consistent standard errors in parentheses)

*** indicates statistical significance at the 1 percent level.

1. The proportion of firms whose growth rates exceed the estimate of the maximum growth rate that can be financed by relying only on internal and short-term financing.

Market Capitalization/GDP: The value of domestic equities listed on domestic exchanges as a share of GDP. Turnover: The total value of trades of domestic shares on domestic exchanges as a share of market capitalization.

Other regressors: rate of inflation, the law and order tradition of the economy, i.e., the extent to which citizens utilize existing legal system to mediate disputes and enforce contracts, growth rate of real GDP per capita, real GDP per capita, government subsidies to private industries and public enterprises as a share of GDP, and net fixes assets divided by total assets.

Time period: The dependent variable is averaged over the 1986-1991 period. All regressors are averaged over the 1980-1985 period, data permitting.

Love (2003):

- Examines whether fin dev eases firms' financing constraints.
- Firm level data; 40 countries.
- Findings:

– Sensitivity of investment to internal funds is greater in countries with poorly developed financial systems.

- Greater fin dev reduces the link between availability of internal funds and investment

– Fin dev is particularly effective at easing the constraints of small firms.

Country Case Studies

Jayaratne and Strahan (1996): U.S. States:

- Since early 1970s 35 states of the U.S. relaxed impediments on intrastate branching for banks.
- Estimates the change in economic growth rates after branch reform relative to a control group of states that did not reform.
- Finds that branch reform accelerated real per capita growth rates by improving the quality of bank loans and the efficiency of capital allocation.

Guiso, Sapienza and Zingales (2002): Regions of Italy:

- Using an extraordinary dataset on households and financial services, examine the effects of differences in local fin dev on economic activity across the regions of Italy.
- Finds that local fin dev
 - enhances the probability that an individual starts a business;
 - increases industrial competition;
 - promotes the growth of firms.

Haber (1991, 1997): Brazil & Mexico (1830 – 1930):

• Brazil: Overthrew the monarchy in 1889, formed the First Republic, dramatically liberalized restrictions on financial markets.

– Liberalization gave more firms easier access to external finance.

- Industrial concentration fell and production boomed.
- Mexico: Financial liberalization was much more mild under the Diaz dictatorship (1877-1911)
 - Relied on the "political support of a small in-group of powerful financial capitalists".
 - The decline in concentration and increase in economic growth were much weaker than Brazil.

Two Classic Studies:

 Cameron, Crisp, Patrick and Tilly (1967):
 Studies the historical relationships between banking development and early stages of industrialization for

England (1750-1844), Scotland (1750-1845), France (1800-1870), Belgium (1800-1875), Germany (1815-1870), Russia (1860-1914), Japan (1868-1914).

• McKinnon (1973):

Studies the relationship between financial system and economic development in

Argentina, Brazil, Chile, Germany, Korea, Indonesia, and Taiwan.

- Document critical interactions among fin intermediaries, fin markets, govt policies, and the financing of industrialization.
- The mass of evidence emerging from these country studies suggest that better functioning fin systems support faster economic growth.