Financial Systems and Economic Growth: An Empirical Overview*

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Abstract

This paper reviews the empirical literature on links between financial development and economic growth. The endogenous growth literature of the 1990s emphasizes the role of financial development in generating sustained growth through an external effect on aggregate investment efficiency. Much empirical support generally finds out positive associations which finance promotes growth; however time-series evidence is less clear than broad cross-section analysis. Moreover, the evidence suggests heterogeneity across countries, and financial factors especially law, and directions of causality.

1. Introduction

The purpose of this paper is to survey recent empirical studies on the causality between financial systems and economic growth. It is a well known hypothesis that financial structure and economic growth are interrelated (see Greenwood and Jovanovic, 1990, Bencivenga and Smith, 1991, etc...). These recent models of endogenous growth have investigated various mechanisms through causality between financial development and growth. In fact, they have showed that financial intermediation can promote the rate of economic growth. These mechanisms are supported by the fact that financial systems allow investors to choose more productive investments by collecting and analyzing information on investment projects (Greenwood and Jovanovic, 1990, King and Levine, 1993a), by management function of liquidity risks (Bencivenga and Smith, 1991), by diversification function of productivity risks (Saint-Paul, 1992).

We already surveyed in other our paper these theoretical studies show the relationship between financial systems and economic growth. On the empirical side, researchers have shown that a range of indicators are robustly positively correlated with economic growth.[1] Accordingly, we summarize recent empirical work on the link between financial development and economic development in this paper.

Another question lately has been raised which is what type of financial systems promotes economic growth. In short, well-functioning banks and capital markets promote economic growth by different financial services, so that we need to focus on the role of stock markets to demonstrate the connection between financial systems and economic growth. We would proceed in three steps in this paper: The second section looks at empirical studies on financial systems and economic growth. Third section is concerned with the empirical studies on stock market and economic growth, and finally we provide implications of

[1] Recent empirical studies include Roubini and Sala-i-Martin (1992), King and Levine (1993), and Berthelemy and Varoudakis (1995, 1996), etc.

some studies discussing which of bank-based or market-based financial systems is better for promoting long-run economic growth.

2. Overview of empirical studies on financial systems and economic growth [2]

Evidence for a strong relation between financial systems and economic growth has been increasing over time. Some empirical studies are concerned with specific aspects of financial development. In the first place we summarize four empirical studies on financial systems and economic growth.

2. 1. *King and Levine* (1993 b)

King and Levine (1993b) develop a Schumpeterian model of technological progress similar to Romer (1990) or Grossman and Helpman (1991). They stress that financial intermediaries directly influence on real factor of economic growth in four ways; (I)evaluating entrepreneurs, (II)pooling resources, (III)diversifying risk, (IV)valuing the expected profits from innovative activities. In short, financial systems play an active role in evaluating, managing and funding the entrepreneur's project that leads to productivity growth. Accordingly, better financial systems increase the probability of successful innovation. Then with their theoretical model as background, they present various types of evidence to show the channels through which financial development may be linked to long-run growth.[3] To put it more concretely, they analyze the empirical relationship between financial indicator and three growth indicators, (i) the average rate of real per capita GDP growth, (ii) the average rate of growth in the capital stock per person, (iii) total productivity growth. As a result, they show that a large set of financial indicators is strongly connected with economic development, capital accumulation, and productivity growth and capital investments.

Moreover, they focus on financial sectors of 5 countries (Argentina, Chili, Indonesia, Korea and the Philippines) as case studies. The results suggest that financial sector reforms lead to higher level of financial development.

2. 2. *Berthelemy and Varoudakis* (1995)

As shown by recent work of endogenous growth (G. Saint-Paul, 1992, Tressel, 2002), there are multiple equilibriums characterized by low or high real growth, according to the financial sector's development level of the economy.

In previous section we summarized that King and Levine (1993 b) stress that financial intermediations lead to the efficiency of various investment projects and investor's abilities by collecting information, and then they test about the relation between financial and economic developments assuming that the steady-state growth rate is linear. Berthelemy and Varoudakis (1995), however, suggest that the assumption is not necessary. In short, assuming that the steady-state growth rate is not necessarily linear allows a very different long-run growth rate to correspond to a given level of a control variable which depends on whether

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[2] For detailed results of four studies we summarize in this part see Appendix Table1 (p9-10) in the last of paper.
[3] See Chisako Yamane (2005) for a detailed description of King and Levine (1993) 's model.

the economy is converging to "high-growth" or "low-growth" steady-state equilibriums.

They conclude that educational achievement is a priority factor to check for potential poverty traps, but also financial factors may lead to high or low growth equilibrium. In short, financial factors may cause convergence groups with similar long-run growth rates. The empirical results show that incompletely financial systems might strongly interrupt economic development in countries which already have a sufficient human capital.

2．3．*Deidda and Fattouh* (2002)

As Berthelemy and Varoudakis (1996) stress that the steady-state growth rate is not necessarily linear, Deddia and Fattouh (2002) examine whether there is non-linearity between finance and economic growth empirically.

Their empirical evidences show that no significant relationship between financial depth and economic growth in low income sample, however for a high income sub sample financial depth and growth are associated positively. Their explanation is that the fixed resource cost related with the provision of financial services prevents economic growth in developing countries. Therefore, they conclude that there is non-linearity between finance and economic growth.

2．4．*Harrison, Sussman and Zeira* (1999)

Harrison, Sussman and Zeira (1999) review a feedback effect between real and financial development by using a new variable called the cost of financial intermediation. They stress that *"as the economy grows, the banking sector becomes more specialized and thus more cost-effective, which feeds back to capital accumulation and growth."*[4] They use US state-level data for the period 1965-1995 from banks' income statements to measure the cost of financial intermediation and to provide evidence which there is a feedback effect between finance and growth.

Their cross-state regressions show a significant negative relation between the cost of financial intermediation and economic development. Causality tests and two-stage regressions confirm the hypothesis of feedback effect between finance and growth.

As a result of the empirically evidence, Harrison, Sussman and Zeira (1999) conclude economic growth reduces the cost of financial intermediation by attracting new market entrants, by reducing monitoring costs and by promoting specialization. This in turn increases investment and growth.

3．Overview of empirical studies on stock market and economic growth[5]

In this chapter we summarize three empirical studies on stock market and economic growth. It has been of importance of considering the role of stock markets to demonstrate the connection between financial systems and economic growth because countries with well-functioning financial systems have one of the

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[4] See Harrison, Sussman and Zeira (1999) p1.

[5] For detailed results of three studies we summarize in this part see Appendix Table2 (p11) in the last of paper.

conditions conductive to economic growth and a set of institutions that give confidence to foreign investors and thus promote financial globalization by allocating world's capital more efficiently. Well-functioning banks and capital markets facilitate long-term economic growth by different financial services.

3. 1. *Filer, Hanousek and Campos* (1999)

Whether financial development leads to economic growth or it is a just consequence of economic development, that called the causality problem, is an important issue in economics. Here Filer, Hanousek and Campos (1999) show evidence of a positive and significant relationship going from stock market development to economic development by using Granger-causality tests. They conclude that there is a strong connection between stock market and economic growth for the low and lower middle income countries. In short, their evidences show that an active equity market is an important role of economic growth for less developed countries. It has bees stated that an increased development in the equity market could yield liquidity thus lowering the cost of foreign capital that is vital for development. This is substantially important to countries that have insufficient incomes and cannot generate adequate domestic savings.

3. 2. *Levine and Zervos* (1998)

Levine and Zervos (1998) examine the impact of variables measuring stock market activity on predict growth, capital accumulation, productivity improvements, and private savings. They enter simultaneously stock market liquidity and banking development both into regressions, and then they show that their model yield significant results for both. Their evidences show that stock market liquidity and banking development are both positively correlated with current and future rate of GDP growth, capital accumulation and productivity growth. In short, banks and stock markets provide different financial services that facilitate long-term economic growth in different ways. Levine and Zervos (1998) emphasize that financial factors are an integral part of the growth process.

3. 3. *Rousseau and Wachtel* (2000)

Rousseau and Wachtel (2000) extend Levine and Zervos (1998) to a panel context. To account for potential endogeneity between finance and growth they apply a two-stage least squares regression approach. The findings of their cross-section regressions suggest an impact of value traded, but not of market capitalization, (both scaled by GDP) on growth. Using a panel vector auto regression specification, they find evidence for causality running from both stock market indicators (per capita value traded and market capitalization, scaled by a price index) to economic activity. Value traded turns out to be particularly significant. Eventually they show that the adjustment of the stock market indicators with a general price index overstates the effect of market capitalization on economic activity. Instead a share price index should be used to deflate the data, because asset price booms may overstate actual market depth.

4. Bank-based or Market-based financial systems

In this sector, we focus on the studies on discussing the different functions of capital markets and banks and the channels through which intermediaries and stock markets. As P. Rousseau and R. Sylla (2001) point out, it has been of importance of considering the role of stock markets to clear the link between financial systems and growth because countries with well-functioning financial systems will give a good effect on economic growth, and a set of institutions that give confidence to foreign investors and then which promote financial globalization by allocating world's capital more efficiently.[6] To consider whether banks or stock markets are better to promote economic development, it is necessary to compare their functions like correcting and analyzing information and controlling borrowers, diversification of risk leading to the efficiently allocation of savings.

4. 1. *Beck* (2003)

Are financial systems based more on intermediaries or more on markets? Beck (2003) discusses the different functions that capital markets and banks and the channels through which intermediaries and stock markets. He uses two indicators[7], *"structure-activity"* and *"restrict"* to measure the structure of a financial system. *"structure-activity"* is to measure the relative importance of stock markets and banks in a country's financial system. And *"restrict"* is to measure regulatory restrictions on banks' activities. Therefore, Beck (2003) analyzes the connection between these indicators.[8] Namely, he focuses on the relative advantages of financial intermediaries and stock markets; both perform a variety of functions like the efficient mobilization and allocation of savings, which are fulfilled by the better financial systems and thus lead to the higher economic growth.

Consequently, his evidence points out that banks and stock markets operate in different ways and with different focus, and banks may be better than stock markets at overcoming information asymmetries and at providing smoothing of risks, however stock markets may be better than banks at supporting innovative activities and at providing diversification of risks. His empirical findings, however, do not support the market-based or the bank-based view.

4. 2. *Levine* (2002, 2003)

(i) Which is better to promote economic growth, bank-based or market-based financial systems?
   Levine (2002):

Levine (2002) constructs a new dataset to analyze the connection between economic growth and the degree to which countries are bank-based or market-based. He summarizes some implications of papers discussing the difference between the bank-based view and the market-based view as studies we provided in the previous section. According to this, however, he said that *"The main issue is not banks or markets. The*

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[6] See Chisako Yamane (2005) for the detailed reasons why it has been important to consider the view of bank-based or market-based systems.
[7] About a detailed of these indicators, see Appendix Table3 (p12)
[8] See 3 section of Beck (2003) "data set" as regards how to compute "restrict".

issue is creating an environment in which intermediaries and markets provide sound financial services."[9]
He stresses that laws and enforcement mechanisms, that is the legal systems, are a useful way to distinguish financial systems as stated already by La Porta, Lopez-de-Silanes, Shleifer, and Vishny (2000). The data don't provide any evidence for the bank-based or market-based views actually, however Levine (2002) concludes that the law and finance have the importance role of the legal system in boosting overall financial sector development and hence that leads to long-run growth eventually.

(ii) The different statistical procedures and data sets; Cross-country studies and Panel studies of finance and economic growth. Levine (2003):

Levine (2003) discusses not only the summary of the role of financial systems for economic growth but also recent empirical work has different econometric methods and data sets to analyze the role of financial systems in stimulating economic growth. In short, Levine (2003) focuses on the different statistical procedures and then he compares the cross-country approach and the panel approach based on Beck, Levine and Loayza (2000) and Levine, Loayza and Beck (2000)[10]. At first, Beck, Levine and Loayza (2000) find a very strong connection between financial intermediary development and long-run economic growth when using cross-country instrumental variables. On the other hand, Levine, Loayza and Beck (2000) use a GMM estimator developed for panel data to evaluate the relationship between financial development and the sources of growth.

According to them, the panel approach has three important advantages and one particular disadvantage. The first benefit is the ability to exploit the time-series and cross-sectional variation in the data. The second benefit is that the unobserved country-specific effect in the cross-sectional regression is part of the error term so that correlation between the unobserved country-specific effect and the explanatory variables results in biased coefficient estimates. The third benefit is that using a panel overcomes the following problem; the cross-country instrumental variable does not control for the potential endogeneity of all the regressors. However, there is an important disadvantage caused by moving to panel data. For instance, assumed that we construct a panel that consists of data are averaged over seven non-overlapping five-year periods. It causes an important disadvantage. In short, the panel methods may be less precise in assessing the connection between financial development and long-run growth than methods based on lower-frequency data because five years does not adequately proxy for long-run growth.

5. Conclusion

In this paper we reviewed that the empirical literature on links between financial systems and economic growth. Much empirical support has been found for the view of a positive connection between financial indicators and economic growth. Countries with better developed financial systems tend to grow faster. Moreover, well-functioning financial banks and capital markets are each positively linked with economic

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[9] See Levine (2002) p3 for the more detailed explanations.
[10] See Appendix Table1 (p9-10) about these studies in the last of paper.

growth but they provide different financial services that have effects on economic growth by different ways.

It is a fact, however, that a number of subsequent studies have the potential problems of causality and unmeasured cross country heterogeneity in factors such as saving rates that might cause both higher growth rates and greater financial sector development because of the growth regression framework. Therefore, a number of techniques have been used to deal with those problems, for example as we showed using only initial values of financial variables (King and Levine(1993)), using instrumental variables (Harris(1997)), examining cross-industry variables in growth that should be immune to country specific factors.[11] Moreover, Levine (2003) as shown in the last part of this paper points out the important advantages of the panel approach. Based on these procedures, we shall seek more appropriate empirical methods using panel data set to estimate growth regressions with financial systems and also we may examine the threshold effects related with financial development, fourthly.

References

Beck,T.(2003) "Stock Markets, Banks, and Economic Development: Theory and Evidence", EIB Papers,voj8,iss.1, pp 36-54.

Beck, T.and Levine, R. and Loayza, N. (2000) "Finance and the sources of growth",Journal of Financial Economics vol58, pp261-300

Bencivenga,V.R.and Smith, B. D. (1991) "Financial Intermediation and Endogenous Growth", Review of Economic Studies, vol58, pp1029-1059

Berthelemy, J.C.and Varoudakis, A. (1996) "Economic Growth, Convergence Clubs, and the Role of Financial Development", Oxford Economic Papers, vol48, pp300-328

Berthelemy, J. C. and Varoudakis, A. (1996) "Financial Development, Policy and Economic Growth"

Berthelemy, J. C. and Varoudakis, A. (1996) "Models of Financial Development and Growth", In Hermes, N. and R.Lensink, eds., Financial Development and Economic Growth, Routledge (1996)

Deidda, D. and Fattouh, B. (2002) "Non-Linearity between Finance and Growth", Economic Letters, vol74, pp339-345

Filer, R. and Hanousek, J. and Campos, N. (1999) "Do Stock Markets Promote Economic Growth", William Davidson Institute Working Papers Series 267

Greenwood, J. and Jovanovic, B. (1990) "Financial Development, Growth, and the Distribution of Income", Journal of Political Economy, vol198, pp1076-1107

Greenwood, J. and Smith, B. D.(1997) "Financial Markets in Development, and the Development of Financial Markets", Journal of Economic Dynamic and Control, vol21, pp145-181

Harris, P. and Sussman, O. and Zeira, J. (1999) "Finance and Growth : Theory and New Evidence", Board of Governors of the Federal Reserve System Finance and Economics Discussion Series ", #99/35

King, R. G. and Levine, R. (1993a) "Finance, Entrepreneurship, and Growth", Journal of Monetary Economics, vol32, pp513-542

King, R. G. and Levine, R. (1993b) "Finance, Entrepreneurship and Growth:Theory and Evidence",

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11 In Filer, Hanousek and Campos (1999), they point out about the problems more.

Journal of Monetary Economics, vol32, pp513-542

Levine, R.(2002) "Bank-based or market-based financial systems: Which is better？" , NBER working paper series 9138

Levine, R. (2003) "More on Finance and Growth: More Finance, More Growth?" , The Federal Reserve Bank of St. Louis, pp31-80

Levine, R. and Zervos, S. (1998) "Stock Markets,Banks,and Economic Growth" American Economic Review, vol88, pp537-558

Levine, R. and Loayza, N. and Beck, T.(2000) "Financial intermediation and growth: Causality and causes" , Journal of Monetary Economics, vol46, pp31-77

Rousseau, P. L. and Sylla, R. (2001) "Financial Systems, Economic Growth, and Globalization" , National Bureau of Economic Research Working Paper.8323, pp31

Rousseau, P. L. and Wachtel, P. (2000) "Equity Markets and Growth : Cross-Country Evidence on Timing and Outcomes, 1980-1995" , Journal of Banking and Finance, vol24, pp1933-1957

Saint-Pall, G. (1992) "Technological Choice, Financial Markets and Economic Development" , European Economic Review, vol36, pp763-781

Appendix.

Table 1 : Overview of empirical methods; financial intermediation and economic growth

Author	Countries	Period	Main dependent variables	Main independent variables	Result
King and Levine (1993b)	92 Case studies: Chile, Korea, Philippines, Argentina, Indonesia	1960-1989	· GYP= real p.c. GDP growth rate · GK= real p.c. capital stock growth rate · INV= ratio of investment to GDP · PROD= productivity growth	· DEPTH=(M3 / GDP) · BANK=(deposit money bank domestic credit / deposit money bank domestic credit + central bank domestic credit) · PRIVATE=(credit to private sector / total domestic credit) · PRIV / Y=(credit to private sector / GDP)	All financial indicators significant in three-stage regressions. Case studies: financial sector leads to higher level of financial development.
Berthelemy and Varoudakis (1995)	91, All groups	1960-1985	Real p.c. GDP growth	· Depth=(M2 / GDP) (initial values)	Threshold effects result in converging to high or low growth steady-state equilibrium (poverty traps).
Deidda and Fattouh (2002)	119	1960-1989	· real p.c. GDP growth	· financial depth=(liquid liabilities / GDP) *initial and contemporaneous regressions	No significant relationship between financial depth and economic growth in low income sample but positive connection between finance and growth for high income sample regressions.
Harrison and Sussman and Zeira (1999)	US state	1965-1995	· COST / GLL= cost of financial intermediation · GSP / CAPITA= real gross state product per capita	· COST / GLL · GSP / CAPITA *set of instruments to isolate the effect of COST/GLL on GSP/CAPITA.	Cross-state regressions show a significant negative relation between the cost of financial intermediation and economic development. Causality tests and two-stage regressions show the hypothesis of feedback effect between finance and economic growth.

Beck, Levine and Loayza (2000)	61	1960-1995 *private saving 1971-1995	· Real per capita GDP growth · Productivity growth · Capital per capita growth	* cross-country instrumental variables with legal origin as instruments. · Private credit = log(credit by credit money banks and other financial institutions to the private sector divided by GDP) · Log(initial income per capita) · Log(average years of schooling)	Cross-country approach using instrumental variables find a very strong connection between financial intermediary and long-run economic growth. * They show the evidence by using a panel technique but here we mention only cross-country approach in order to compare with panel data approach of LLV (2000).
Levine, Loayza and Beck (2000)	74	1960-1995 5-year intervals	· Real per capita GDP growth · Productivity growth · Capital per capita growth	* dynamic panel(5-year average) generalized method of moments using system estimator. · Private credit = log(credit by credit money banks and other financial institutions to the private sector divided by GDP) · Log(initial income per capita) · Log(average years of schooling)	Positive significant relationship between financial development and the sources of growth by use a GMM estimator developed for panel data.

Table 2 : Overview of empirical methods; stock market and economic growth

Author	Countries	Period	Main dependent variables	Main independent variables	Result
Filer, Hanousek and Campos (1999)	All countries; 70 Mature Markets; 23 Emerging Markets; 47*	1985-1997*	· panel; real p.c. GDP growth, lagged growth rate	· three variables of stock market development measured; (i) market capitalization/GDP, (ii) turnover velocity, (iii) the change in the number of domestic shares(companies) listed.	Causal relationship going from stock market development to economic growth by using Granger-causality tests is positive and significant, especially for less developed countries.
Levine and Zervos (1998)	47 all groups of countries	1976-1993	· real p.c. GDP growth · growth in capital stock p.c. · productivity growth · gross private savings rate	· stock market liquidity = value traded ratio in 1976 (=annual value of all stock market trades/GDP), Turnover ratio in 1976 (=total value of domestic shares traded/market capitalization)	Stock market liquidity and banking development both into regressions yield significant results for both. Stock market liquidity and banking development are both positively correlated with current and future rate of GDP growth, capital accumulation and productivity growth.
Rousseau and Wachtel (2000)	47	1980-1995	· cross-section ; real p.c. GDP growth · panel ; real p.c. GDP	· market capitalization / GDP · value traded / GDP · p.c. value traded · p.c. market capitalization (both indicators share-price vs. general price-level adjusted) · real p.c.M3	Cross-section regressions suggest an impact of value traded, but not of market capitalization on growth. Panel results indicate causality running from both stock market indicators to economic activity. Value traded turns out to be particularly significant.

* See Filer, Hanousek and Campos (1999) p20 Table3 for more detailed. They provide the list of countries and useable periods. They estimate the casual connection for countries divided into three groups according to per capita income, and compare between all countries and mature markets and emerging markets. The classification of countries is the basis for the IFC's definition of "mature" and "emerging" markets.

Table 3 : Overview of empirical methods; the different functisons that bank-based and market-based systems have in economic growth

Author	Countries	Period	Main dependent variables	Main independent variables	Result
Beck (2003)	40	1975-1998	*To analyze the link between stock market and bank development and economic growth;		
			· average real per capita GDP growth rates	· turnover ratio as market liquidity = the value of shares traded on domestic exchanges divided by the total value of listed shares · bank credit = bank claims on the private sector by deposit money banks divided by GDP	Ordinary-least squares regressions show the strength of the independent link between both stock market and bank developments and growth.
			*To measure the structure of a financial system;		
			· real per capita GDP growth rates	"structure-activity" = log(the ratio of the turnover ratio to bank credit) "restrict" = aggregations of sub-indices that gauge restrictions on banking along four dimensions: activities in the (i) securities, (ii) insurance, (iii) real estate markets and (iv) ownership and control of non-financial firms.	No significant correlation between financial development ("structure-activity") and the degree of bank restrictions ("restrict").
Levine (2002)	48	1980-1995	· real per capita GDP growth	· Structure-Activity = Log(total value traded ratio / bank credit ratio · Structure-Size = log (market capitalization ratio / bank credit ratio) · Structure-Efficiency = Log(total value traded ratio *overhead costs) · Structure-Aggregate = Principal component of Structure 1, 2, 3 · Structure-Regulatory = Index of regulatory restrictions on commercial bank activity	*Financial Structure:* Financial structure by using Ordinary least squares estimation is not significantly related to economic growth. The results are inconsistent with both the bank-based and the market-based views. *Sensitivity of the Financial Structure:* Financial structure by using instrument variables is not positively and negatively related to economic growth.

	· Finance-Activity = Log (total value traded ratio *private credit ratio) · Finance-Size = Log (market capitalization ratio + private credit ratio) · Finance-Efficiency = Log (total value traded ratio / overhead costs) · Finance-Aggregate = Principal component of Finance 1, 2, 3	*Financial Development:* Financial development is positively and significantly related to economic growth in the international cross-countries data.