The role of the financial sector in economic growth

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Abstract

In this paper we consider the relationship between financial development and economic activity from 1960 to 2006 in 71 economies. A number of contributions in the literature suggest that deeper financial markets promote economic growth. We put this assertion to the test conducting regression analysis at both the levels and growth rates of the relevant variables. We do not find substantial evidence of a causal effect of the rate of financial development on economic growth.

Introduction

Early models of economic growth highlighted the importance of saving rates (i.e. how much an economy saves as a proportion of its income) and population growth rates in determining income per person (neoclassical growth theory). One implication of such models is that rich and poor countries' levels of income per person should converge. Difficulties in reconciling the 'convergence hypothesis' with the actual data led to the development of 'endogenous' growth models that did not feature the same implication (i.e. countries need not converge to the same level of income per person). This framework opened the way for considerations of other determinants of long term growth such as fiscal policy and financial development. The latter has become the focus of a growing literature in the last two decades.

The key role of the financial sector in economic growth is introduced by Schumpeter (1911). He argued that the service provision by financial intermediaries including savings mobilization, risk management, projects evaluation, monitoring the managers, and facilitating transactions are necessary for technological improvement and economic growth. Financial intermediaries need to be capable of efficient allocation of resources facilitating in that way higher returns and desirable risk transformation. The

modern literature on economic growth was actually started in mid 1950s when Robert Solow (1956) presented his growth model. At that time the focus was kept on the functioning of labour and capital resources rather than financial markets. Some leading economists like Goldsmith (1969), McKinnon (1973), Levine (1993) emphasized that finance can be an essential component for the growth of an economy.

The key question for the policymakers in less developed economies is how to have a process of sustained economic growth. Underdeveloped countries have the agenda to support financial sector reforms. A better developed financial system reduces transaction, information and monitoring costs. It increases the efficiency of resource allocation and in turn spurs the growth. A well developed financial system promotes investment opportunities to potential businesses, mobilizes savings, enables trading, monitors the workings of managers, offers hedging, and diversifies risk (Levine 1993).

A proper legal and policy structure is required to have a strong financial system. Most of the underdeveloped economies are facing financial repression in the form of high inflation rates, directed or subsidized credits, credit rationing, loan and deposit interest rate ceilings. According to Roubini and Sala-i-Martin (1992) strong financial repression can reduce per capita GDP by one percentage point an year. The governments sometimes adopt the policies of financial repression and raise the inflation rate to get the effortless inflationary income, but that lowers the amount of financial services in the economy. All these actions stimulate the individuals to store nominal money. The negative effects of financial repression reduce the marginal product of the capital input and therefore reduce the economic growth (Roubini and Salai Martin, 1992).

An efficient financial system offers improved financial decisions, supports the better distribution of resources and thereby accelerates economic growth. A strong financial sector needs to have deep rooted domestic and international banking system as well as liquid stock markets. The current paper by using the recent data sets attempts to assess whether the level of the financial development is a strong indicator for economic growth. Attention is paid to the issue of causality: is it financial development that causes economic growth or economic growth causes financial development? Before we proceed, certain contributions to the literature on finance and growth is summarised in a table and given below.

Authors	Date	Number of Countries	Data Range	Frequency	Methodology	Main results
Goldsmith	1969	35	1860-1963	Annual	Cross country regressions	Rough parallelism viewed Positive
Atje & Jovanovic	1993	40	1960-1985	Annual	Cross country regressions	Positive in favor of market based financial system
Levine & Zervos	1996	41	1976-1993	Annual	Cross country regression	Positive in favor of market based financial system
Ross Levine	1997	77	1960-1989	Annual	Cross country regressions	Positive
Levine & Zervos	1998	24	1976	Averaged 1997-85 1986-93	Pooled data 2 Stage least square Cross country regression	Positive
Ross Levine	1999	71	1960-1995	Annual	Cross country regression	positive
Rajan & Zingales	1998	41	1980-1990	Annual	Regressions Fixed effects	Positive
Claessens et al	2001	80	1988-1995	Annual	Cross country regressions	Financial liberalization positively affects growth

Levine & Carkovic	2002	40-54	1975-1988	5 yr average	Generalised Method of Moments Cross country regressions	Strong positive
Arestis & Luintel	2001	5	1972-1999	Annual	Vector auto regressive (VAR)	Positive in favour of bank based financial system
Caporale et al	2004	7	1977-1998	Annual	Cross country regressions	Positive in favour of market based financial system
James & McKibbon	2006	Malaysia	1960-2001	Annual	Cointegration tests Likelihood Ratio Tests Lagrange Multiplier Tests	Reverse causality Found No Long run relationship

Table 1: Financial Development and Growth: Existing Literature

The table above presents a sample of some of the main findings in finance and growth relationship. Goldsmith (1969) studied 35 countries to study the relationship between finance and growth with annual observations from 1860 to 1963. It was found that financial development effects positively on growth. Levine (1997, 1999) has supported the positive relationship between financial development and economic growth. A number of methodologies and various sample periods are employed to examine this relationship. It is found that financial development has a strong positive impact over economic growth. An important issue related to finance and growth relationship is the structure of financial system. In various studies it is examined, whether bank based financial systems accelerate the economic growth rapidly or market based system are more helpful in achieving fast economic growth. Atje (1993), Levine (1996), and Arestis (2001), studied the same with different number of cross sections. Some favour bank based others support market based systems. It was also observed that more developed countries rely much on market based financial system whereas emerging and underdeveloped economies give more importance to bank based financial systems. Financial liberalization helps to achieve financial development and in turn boosts the economic growth. Claessens (2001) studied the same with 80 cross section and annual observations from 1988 to 1995and found that financial liberalization effects positively on financial development and in turn accelerates growth.

Data

To our knowledge, this paper employs most recent data than the previous studies. A variety of sources are utilized to carefully collect the data from various sources through ESDS.[1] Real GDP is used to construct our measures of economic growth. The financial indicators[2] include three bank indicators (*depth*, *banks*, and *privy*) and two stock market indicators (*value traded ratio* and *turnover ratio*). To analyse the intensity of the independent link between financial development and growth a number of other growth determinants are controlled; these are the inflation rate, the trade to GDP ratio, the exchange rate regimes[3] (i.e. whether a country operates a fixed exchange rate regime, a flexible exchange rate regime or something in between), and government consumption to GDP ratio.

[1] The main sources are the World Development Indicators and the IMF International Financial Statistics.
[2] The source for these data is Levine (2000).
[3] The source for these data is Rogoff et al (2004).

The whole data set is divided into four groups on the basis of World Bank income groups. World Bank segregates the countries on the basis of the GNI (gross national income) per capita. The groups are: low income countries, middle income countries (subdivided into lower middle and upper middle income), and high income countries. The low income countries have GNI of $935 or less, the lower middle income countries have GNI $936 - $3,705, the upper middle income countries have GNI $3,706 - $11,455, and the high income countries have GNI of $11,456 or more. The initial sample of countries consists of 211 countries. However, due to unavailability of long term data on some of the variables our estimations only use data for 71 cross sections.

The indicator of "bank" (proxy for financial development) is the degrees to which central bank versus commercial banks are issuing credit. It can be calculated by dividing the bank's credit by the banks credit plus domestic assets of central banks. This measure basically finds the efficiency of banks, as banks are more likely to provide financial function as compare to central banks. The second indicator of financial development "depth" determines the size of the financial intermediaries and is calculated by the liquid liabilities of the financial system divided by GDP (liquid liabilities include the currency, plus demand as well as interest-bearing liabilities of banks and nonbank financial intermediaries). The third indicator of financial development is "Privy" i.e. the credit allocated to private projects divided by the GDP. The intuition behind this measure is that strong financial systems allocate more credit to private firms to promote research, and innovation mobilizing savings, and facilitating transactions.

To capture the impact of stock market development two indicators are included: "turnover ratio" and "value traded ratio". Turnover ratio can be calculated by dividing the total value of all listed shares traded on the stock exchange of a country by its stock market capitalization. The main reason behind calculating this indicator is that it reflects the trading relative to the size of the market. There are strong chances of variability in results when making a comparison among different countries. A small liquid market can have a high turnover ratio with small value

traded ratio. This indicator also help to find the extent to which the agents can quickly, cheaply, confidently trade the claims of ownership to a large percentage of an economy's dynamic technologies. The second stock market indicator included in this work is value traded ratio i.e. the total value all the listed shares traded on the stock exchange of a country divided by its GDP.

To analyse the strength of the link between financial development and economic growth a number of other growth determinants are controlled. These are the inflation rate, the trade (sum of exports and imports of goods and services) to GDP ratio, the exchange rate regimes, and the government's final consumption expenditure to GDP ratio.

The correlations between the levels of financial indicators with the level of GDP are examined. Table 3 shows these for all income groups. All variables are found positively correlated with the level of real GDP. The level of stock market indicators (value traded ratio, turnover ratio) shows stronger positive correlation compared to the bank indicators with the level of real GDP.

Methodology

This section uses panel data techniques to examine empirically the relationship between financial development and economic growth. The data set consists of 71 cross sections over the period of 1960 to 2006. Panel data utilizes the available information more efficiently and allows for the variability of intercepts in the estimated equation. The main model employed is (see Baltagi, 1997)

$$G_{it} = \alpha_i + \beta' F_{it} + \varepsilon_{it}$$

$$i = 1, \dots, N, t = 1, \dots, T$$

where G is the log of GDP, i subscript denotes the country, t subscript denotes time, α is the intercept, β is a vector containing the estimated slope coefficients of our financial development indicators and control variables. ε_{it} is the error term.

The results of the fixed effects model (FEM, which is also known as least square dummy variables LSDV) are reported in Table 4. The standard assumption of FEM model is that β is constant for all *i* and *t*, but the intercept is allowed to change across countries. This means that the effects of financial development are the same for all periods and cross sections, but the average level of economic *i*th cross section may be different from *j*th cross section. Thus α_i captures the effects of those variables which are peculiar to the *i*th cross section and that are constant over time. In standard cases, ε_{it} is independently and identically distributed across sections and over time, with zero mean and constant variance.

The table given below on next page summarizes the explanatory variables with their assumed effects on growth in terms of signs. The signs for financial development indicators including bank, depth, privy, turnover ratio, and value traded ratio are expected to be positive, because we assume that higher values for these indicators will raise GDP growth. Inflation is expected to have a negative relationship with real GDP. The estimated results of inflation on investments and growth are negative. Fischer (1993) supported the negative relationship between inflation and growth as inflation reduces growth by decreasing investments savings and capital accumulation.

Table 2: Expected Signs of the variables

Variable	***Expected signs***
Bank	+
Depth	+
Privy	+
Turnover Ratio	+
Value traded ratio	+
Inflation	-
Trade to GDP	+
Government expenditure to GDP	+
Exchange rate regimes	+

Yanikkaya (2002) asserted that trade has a positive impact on GDP growth. Trade promotes growth positively through a number of ways like technology transfers, scale economies and comparative advantage. Cheryl Gray (2007) suggests that higher government expenditure can have a positive impact on growth if the government spends in productive areas. Countries with good governance can collect taxes in efficient and effective manner. Thus, higher spending in productive manner can lead to higher level of growth.

The exchange rate regime can affect economic growth in several ways. Per capita GDP growth is found to be slightly higher under floating regimes in Ghosh et al, (1996). Huang and Malhotra (2005) studied that "the importance of exchange rate regime choice for economic growth depends on the level of development of an economy. The selection mostly does not mater in case of the advanced economies while the emerging and Asian developing economies must give more consideration to their selection of exchange rate regimes. In this regard the capital account, development level, and capital market development should always be under consideration.

Estimation results

We begin with a simple LSDV estimation in levels. Results are reported in Table 4. The financial development indicators, including *bank, depth, privy, turnover ratio* and *value traded ratio* appear to have a statistically significant effect on (the log of) real GDP. In the subsample of low income economies *depth, turnover ratio* and *value traded ratio* appear to have a positive and significant impact on real GDP. In the lower middle income countries group, all five financial development indicators appear with positive and statistically significant results. In the case of upper middle income countries the results show that *depth privy* and *turnover ratio* are also positively associated with the dependent variable. Finally positive and significant results are found in the case of high income countries.

The results for the control variables are also presented in Table 4. The set of controls include government expenditure to GDP, inflation, trade to GDP, and the Reinhart and Rogoff (2004) index of exchange rate regimes. Rousseau and Wachtel (2000) assert that inflation affects economic growth both directly and indirectly through its effect on financial development. The negative relationship between inflation and growth in the long run is due to the episodes of high inflation. In short run inflation is associated with the rapid economic growth rate. A negative effect of inflation arises only in a high inflationary environment (Bruno and Easterly, 1998). The same is found in our regressions. We have found negative impact of inflation on growth.

The above regression results could potentially be seen as encouraging. However, it is important to check whether the variables are stationary, i.e. check for the presence of unit roots in the variables. In addition, claims for an "effect" of financial development on GDP would be premature, if we do not use appropriate methods to establish causality.

The IPS (Im, Pesaran and Shin) W-stat tests are employed to test the null of stationarity for all variables. The results are reported in table 5. The results show that four out of seven variables (*real GDP, Depth, Privy*, and *stock market capitalization*) have unit roots. They are integrated of order one because they are non stationary in

levels but stationary at first difference. The other variables are found stationary at levels. To deal with issues of non-stationarity we take the first difference for all variables. Table 6 reports the estimated coefficients of the regression. Overall the results are not statistically significant –a very different picture to the one we found from the 'levels' estimations. It now appears that for our sample of countries there is no meaningful effect of financial development on economic growth. Only the *bank* variable shows a positive effect on real GDP growth in the low middle income and high income countries. *Privy* is found significant only in the case of lower middle income countries.

We next turn to the causality issue in the financial development and economic growth relationship. Does "finance" lead or follow growth? Does finance have a causal impact over growth? Is it financial development which implies growth or its economic growth that implies financial development? A few studies suggest that it is the high level of income which creates the demand for developed financial system. When income increases the demand for better financial services also rises. Schumpeter (1934) focused on financial development determining economic growth. Robinson (1952) wrote that "where enterprise leads finance follows".

To deal with the issue of double causality, the method of two stages least squares (2SLS) is used. All variables are instrumented by their lagged values. The results are shown in table 7 and show that despite the fact that most financial development indicators enter the estimated equation with a positive sign there is no statistical significance.

Conclusion

In this paper we have examined the effects of financial development on economic growth from 1960 to 2006 in 71 economies. We do not find evidence to support the assertion that financial development causes economic growth. Our results are similar with Favara (2007) who finds that financial development is correlated with economic growth but the development of financial sector does not cause the economic growth.

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Table: 3 Correlation level of Financial Development and level of Real GDP (1960)

	All	Low income	Lower mid income	Upper mid income	High income
Bank	0.29	0.32	0.07	-0.18	0.56
Depth	0.31	0.54	0.12	-0.36	0.03
Privy	0.46	0.51	0.25	-0.26	0.35
Value traded ratio	0.58	0.53	0.43	0.29	0.49
Turnover ratio	0.57	0.46	0.49	0.42	0.52

All the variables are in terms of natural logarithms

Table 4	**Panel Results**	**Estimated**	**coefficients**		
Variable	All	Low Income	Low Mid Income	Upper mid income	high Income
C	25.0527*	24.8963*	24.6573*	24.8815*	26.1523*
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Bank	0.1580*	0.0310	0.2811*	0.1519	1.0464*
	(0.0003)	(0.5879)	(0.0009)	(0.1354)	(0.0001)
Depth	0.2490*	0.2905*	0.2848*	0.3381*	0.4050*
	(0.0000)	(0.0035)	(0.0000)	(0.0000)	(0.0000)
Privy	0.0778*	0.0277	-0.0674**	0.1608*	0.1385*
	(0.0003)	(0.6850)	(0.0488)	(0.0010)	(0.0001)
Turnover Ratio	-0.0501*	-0.0859*	-0.0963*	0.0396**	-0.1242*
	(0.0000)	(0.0006)	(0.0000)	(0.0494)	(0.0000)
Value Traded Ratio	0.0945*	0.1823*	0.1065*	0.0213	0.1224*
	(0.0000)	(0.0000)	(0.0000)	(0.1759)	(0.0000)
Inflation	-0.0207*	-0.0063	-0.0197**	-0.0268**	-0.0200
	(0.0010)	(0.7139)	(0.0311)	(0.0416)	(0.1405)
Fiscal_GDP	-0.0094*	-0.0049	-0.0116*	-0.0104*	-0.0169*
	(0.0000)	(0.1997)	(0.0002)	(0.0196)	(0.0051)
Trade_GDP	0.0045*	0.0051*	0.0011	0.0060*	0.0037*
	(0.0000)	(0.0000)	(0.2464)	(0.0000)	(0.0000)
Exchange rate regime	0.0229*	-0.0685	0.0063	0.0128	0.0555*
	(0.0337)	(0.1947)	(0.7709)	(0.6191)	(0.0001)
R-squared	0.9925	0.9947	0.9918	0.9905	0.9934
Adjusted R-squared	0.9919	0.9940	0.9908	0.9893	0.9927

Note : Dependent variable is Log real GDP 1960 - 2006, and natural Log is taken for all variables except FIS-GDP and TR_GDP. (p values in brackets)

(*) indicates significance at 1% level,

(**) indicates significance at 5% level,

(***) indicates significance at 10% level,

Table 5: Unit Root Tests

Variable	IPS Statistics	Probability	Variable	IPS Statistics	Probability
GDP	7.09	1.0000	ΔGDP	-44.23	0.0000
Bank	-7.66	0.0000	Δ Bank	-56.13	0.0000
Depth	4.22	1.0000	Δ Depth	-36.45	0.0000
Privy	3.13	0.9991	Δ Privy	-29.28	0.0000
Turn Over Ratio	-3.54	0.0002	Δ Turn Over Ratio	-28.72	0.0000
Value Traded Ratio	-3.03	0.0012	Δ Value Traded Ratio	-23.35	0.0000

Table 6 : Panel Results Estimated Coefficients

Variable	All	Low Income	Low Mid Income	Upper mid income	high Income
C	0.0657*	0.0282	0.0779*	0.1395*	0.1319*
	(0.0000)	(0.4259)	(0.0000)	(0.0000)	(0.0000)
Bank	0.0373*	0.0104	0.0921*	0.0654	0.2622*
	(0.0007)	(0.4340)	(0.0008)	(0.1523)	(0.0000)
Depth	-0.0543*	-0.0659***	-0.1543*	0.0188	-0.0629*
	(0.0004)	(0.0849)	(0.0000)	(0.5159)	(0.0043)
Privy	0.0049	-0.0215	0.0391**	-0.0330	0.0099
	(0.6425)	(0.5230)	(0.0368)	(0.1672)	(0.5052)
Turnover Ratio	-0.0033	-0.0082	-0.0048	0.0094	-0.0145*
	(0.2760)	(0.3354)	(0.3993)	(0.1170)	(0.0077)
Value Traded Ratio	0.0071**	0.0095	0.0075	-0.0017	0.0134*
	(0.0113)	(0.2299)	(0.1762)	(0.7557)	(0.0022)
Inflation	-0.0047*	-0.0068**	-0.0071*	-0.0002	-0.0023
	(0.0011)	(0.0578)	(0.0086)	(0.9560)	(0.2824)
Fiscal_GDP	-0.0014*	0.0004	-0.0002	-0.0031*	-0.0052*
	(0.0016)	(0.6847)	(0.7677)	(0.0016)	(0.0000)
Trade_GDP	0.0001***	0.0006*	0.0000	0.0000	0.0000
	(0.0959)	(0.0049)	(0.9382)	(0.6993)	(0.8687)
Exchange Rate Regime	-0.0092*	-0.0137	-0.0197*	-0.0217*	-0.0030
	(0.0000)	(0.3457)	(0.0002)	(0.0004)	(0.1596)
R^2	0.3027	0.3144	0.3468	0.2809	0.5149
Adjusted R^2	0.2385	0.2149	0.2655	0.1901	0.4610

Note : Dependent variable is d Log real 1960 – 2006. All other variables are in terms of dlog. Except trade to gdp, fiscal to gdp and exchange rate regimes.
(*) indicates significance at 1% level,
(**) indicates significance at 5% level,

(***) indicates significance at 10% level,

Table 7: Estimated Coefficients IV

Variable	All	Low Income	Low Mid Income	Upper mid income	high Income
C	-0.0045	-0.0710	0.1033	0.0334	-0.009824
	(0.8595)	(0.7676)	(0.3653)	(0.5949)	(0.9115)
Bank	0.1097	-0.0908	-0.0410	0.3371	0.916967
	(0.1187)	(0.7292)	(0.7625)	(0.1231)	(0.0252)**
Depth	-0.2179	-0.2051	-0.7148	-0.1263	-0.283306
	(0.1293)	(0.6474)	(0.3464)	(0.3643)	(0.3055)
Privy	0.2476*	0.2673	0.2769***	0.1205	0.171019
	(0.0031)	(0.7159)	(0.0654)	(0.2259)	(0.2505)
Turnover ratio	0.0019	0.0054	0.0308	0.0325	0.007211
	(0.9253)	(0.961)	(0.3787)	(0.2129)	(0.8093)
Value traded ratio	0.0132	-0.0775	-0.0515	-0.0249	-0.013821
	(0.6629)	(0.6644)	(0.3708)	(0.5647)	(0.7223)
Fiscal_GDP	0.0008	-0.0006	0.0019	0.0015	-0.000463
	(0.4037)	(0.9144)	(0.5796)	(0.6294)	(0.8683)
Trade_GDP	0.0003	0.0005	-0.0002	-0.000032	0.000411
	(0.1557)	(0.532)	(0.8157)	(0.8847)	(0.3074)
Exchange rate regimes	0.0062	-0.0250	-0.0324	-0.0066	0.010118
	(0.2871)	(0.8001)	(0.385)	(0.6444)	(0.2825)
Inflation	-0.0054	0.0680	0.0058	0.0011	-0.000979
	(0.2217)	(0.6743)	(0.6925)	(0.8816)	(0.8889)
R^2	0.2265	-3.8926	-1.1704	-0.0881	-0.1848
Adjusted R^2	-0.3384	-4.5915	-1.4383	-0.2241	-0.3154

Note : Dependent variable is d Log real GDP 1960 – 2006. All other variables are in terms of dlog. Except trade to gdp, fiscal to gdp and exchange rate regimes. All variables are instrumented by their lagged values
(*) indicates significance at 1% level,
(**) indicates significance at 5% level,

(***) indicates significance at 10% level,