Nexus between Financial Sector Development and Economic Growth: Empirical Analysis of 112 Countries

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I. Introduction

International statistics show that almost 30 percent of total world population lives on less than $765 GNI per capita per year in 2005. In comparison, this indicator for developed countries is more than $9,385 per year. This huge difference in per capita income can be accounted for by various factors which affect long-run economic growth. One of the vital aspects that contribute the economic growth is the financial sector development.

According to Levine (2004) the financial instruments, the markets, and the intermediaries are the factors of financial sector development that can promote economic growth. Well-functioning financial intermediaries and markets can promote long-run economic growth (Beck et.al, 2001). However, the financial sector development varies across countries because of different degree of the financial intermediation, the rule of law, and a number of other endogenous and exogenous reasons.

As outlined in a number of studies, financial sector development can affect economic growth through five main functions. *Efficiently allocated savings* can offer low cost financial resources for industry and firms. Moreover, financial intermediaries help decrease transaction costs, and thereby encourage deposits. Thus, they in turn, increase the funds available for investment. *Managing and reducing risk* can weaken the uncertainty of investment projects and strengthen deposits. The financial intermediaries prepare information on borrowers and provide this information to

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deposit owners in their role of *producing information*. *Monitoring firms and exerting corporate governance* can induce managers to maximize firm's value and improve allocation of resources. At the same time, the effectiveness of corporate governance impacts firm performance with potentially substantial consequences on national economic growth rates. By *easing exchange* function, financial arrangements lower transaction costs which promote specialized production function, technological innovation and growth. The financial arrangements lower transaction costs that will facilitate greater production specialization. Thus, markets that promote exchange encourage productivity gains and financial market development.

A number of studies have looked at the relationship between the financial sector development and economic growth. According to King and Levine (1993), the capital accumulation and technological innovation are main channels for economic growth. King and Levine argued that efficient saving policies can change capital accumulation and technological levels. Hermes and Lensink (2003) found that financial sector development is essential for productive FDI that leads to economic growth. Allen and Leonce (1998) argued that the financial sector development provides a motivation to increase fruitful investment.

In order to find nexus between financial sector development and economic growth this paper reexamine the role of financial sector development in the long run economic growth based on King and Levine's model (Levine, 1997, 2004) using panel data analysis for 112 countries. This paper uses the ratio of private sector credits to GDP and the ratio of liquid liabilities to GDP for financial sector development indicators.

The results of full sample regressions show that financial sector development indicators have a statistically significant effect on economic growth. The estimation results show that a 10 percentage point increase in private sector credits increases growth rate by 0.31 percentage point. In low and lower middle income group, and upper middle and high income group countries ' results also show that financial sector development indicators, the ratio of private sector credits to GDP and the ratio of liquid liabilities to GDP, have robust, significant and positive impacts on economic growth.

The paper is organized as follows. Section II presents a theory and a literature review of studies conducted on financial sector development and economic growth.

The studies are divided into three categories based on different data set such as cross section, time series, and panel data analyses. Section III discusses the empirical model, the data and methodology. Section IV presents the results and interpretations of the empirical analysis for different income group countries using five-year average panel data for 33 years. The conclusions are presented in Section V.

II. Literature Review

Many empirical studies attribute the sources of economic growth to factors such as educational attainment, institutional development, factor accumulation, foreign direct investment, savings, government consumption, investment level, resource endowments, and financial sophistication. The relationship between financial sector development and economic growth has long been an interest for economists.

According to Levine's (1997) definition, financial sector development can occur when financial instruments, markets, and intermediaries help improve the flow of information, access to finance, and reduce transaction costs and do a better job at providing its main functions to produce a sufficiently large effect.

Moreover, Demetriades et al. (1996) noted that financial markets can make a difference on economic decision making, and the allocation of resources, by addressing information problems and then they lead a positive result on both the volume and pattern of investment, as well as productivity of physical and human capital. These are important channels for economic growth.

The more contentious issue in this literature has been the direction of causality between financial sector development and economic growth. To analyze this view, Patrick (1966) developed two main hypotheses: the supply-leading and demand-leading hypotheses.

The supply-leading concept notes that the development of financial sector can induce economic growth through savings collection, project valuation, risk management, management control, and financial institutions. Thus, this can contribute to technological innovation and lead to economic growth. Moreover, according to the supply-leading hypothesis, financial sector development leads to transfer resources from traditional sectors to modern sectors and promotes and stimulates an entrepreneurial response in these modern sectors (Roger et al. 2005).

The demand-leading concept shows that the economic growth can stimulate the development of financial intermediation. Economic growth leads to increase the demand for financial services, which in turn encourages the creation of financial intermediaries（Roger et.al. 2005）.

The relevant question is: does financial development cause economic growth or does it simply follow growth generated elsewhere in the economy? Both sides of the argument are supported by several theoretical arguments applying different methodologies, time periods, and a variety of country case studies.

This paper will re-examine in detail the supply-leading hypothesis by analyzing the literature that supports the view that financial sector development induces economic growth. This paper does not look at demand-leading hypothesis for two reasons:

・The studies supporting the demand-leading hypothesis is fairly limited;

・Some studies failed to link economic growth leads to financial sector development;

The most widely known studies were conducted by King and Levine（1993）, Gregorio and Guidotti（1995）, Demirguc-Kunt and Maksimovic（1996）, Beck, Levine and Loayza（2000）, Spiegel（2001）, and Gillman et.al（2004）among others. In order to find more specific outcomes many researchers broaden the areas of investigation by including stock markets, particular country level studies, and firm and industry level analyses.

Cross Country Studies

One of the most influential investigations, which examined the relationship between economic growth and financial sector development using *cross country* data set, was done by King and Levine（1993）. According to King and Levine, the cost of acquiring information, enforcing contracts and undertaking financial transactions creates encouragement for the emergence of particular types of financial contracts, markets and intermediaries.

King and Levine utilized data on 77 countries for the period 1960-1989, by applying four different indicators of financial developments[1], and three different growth indicators[2]. The result shows that the financial sector development can affect economic growth through two channels, namely *capital accumulation* and *technological innovation*. Moreover, the financial sector development positively influences both the

rate of investment and total factor productivity growth. " Financial system affects capital accumulation either by altering the saving rates or by reallocating savings among different capital producing technologies. " (Levine, 2004, p.5)

Time Series Studies

To evaluate the impact of financial sector reforms on economic growth of India, Bhattacharya and Sivasubramanian (2003) used the techniques of unit root and cointegration analysis for their study. In order to estimate the impact of financial sector reforms, authors statistically tested whether there has been any significant effect of financial liberalization on the linear relationship between GDP and Broad Money. The result shows that money, the independent variable, had a statistically significant and positive effect on GDP growth in the case of Indian economy. Authors concluded that Indian economy has some long run equilibrium relationship between GDP and broad money.

Demetriades and Hussein (1996) conducted a time series analysis on not highly developed 16 countries for period of 1960 to 1990. They find a stable long-run relationship between indicators of financial development and economic growth. However, the direction of causality varies considerably across countries.

Panel Data Studies

According to many time series studies, one size does not fit all in the case of the finance-growth relationship. It led a number of authors to apply a *panel data* analyses for examining the nexus of economic growth and financial sector development. A panel sample of indicators of financial development is likely to provide a significant increase in information relative to a simple cross section study.

Benhabib and Spiegel (2000) examined whether financial development affects growth solely through its contribution to growth in factors of production, namely, physical capital and human capital, or factor accumulation rates. They explored the role of financial variables in accounting for growth and investment rates across countries. According to their findings, economic growth depends on two main factors, a nation's enhancement of technology and factors of production. The results show that financial sector development positively influences both rates of investment and total

factor productivity growth.

Hermes and Lensink (2003) empirically investigated the role of the development of the financial system which plays in enhancing the positive relationship between Foreign Direct Investment (FDI) and economic growth. They argue that economic growth will occur only after less developed countries have improved their domestic financial systems. The findings suggest that less developed countries should improve their domestic financial system before liberalizing the capital account to allow for FDI.

Allen and Leonce (1998) conducted research on financial intermediation and economic growth in Southern Africa[3]. However, the study did not find a strong positive effect of credit indicators on economic growth for the Southern African countries. The authors argued that in order to have positive effect on economic growth, financial sector development needs expansion of the financial system to be accompanied by an increase in the flow of funds to fruitful investment activities.

A number of these research lead to a positive long-run association between financial sector development and economic growth. This conclusion supports the supply-leading hypothesis that financial sector development leads to economic growth.

III. The Empirical Model

The financial system influences the allocation of resources across time and space (Levine, 2004, pp.5). King and Levine's model (1993) look at how the financial system can affect the steady state by altering the rate of technological innovation. The theoretical approach is based on four main steps to achieve economic growth, namely, market friction, financial markets and intermediaries, financial functions, and channels to growth.

According to King and Levine, the first step for economic growth is to focus on *market frictions* which consist of the information and the transaction costs. Many other researchers showed how well-developed financial systems reduce the information and the transaction costs, and influence the saving rates, the investment decisions, the technological innovation, and the long-run economic growth rates.

Financial markets and intermediaries are the second step for King and Levine's model. "Without intermediaries, each investor would face the large fixed cost associated with evaluating firms, managers, and economic conditions." (Levine, 2004,

p.7) Financial intermediaries may reduce the cost of acquiring and processing information and thereby improve resource allocation (Boyd and Prescott, 1986). Financial markets and intermediaries can also provide *functions of financial system* by assisting to mobilize savings, allocate resources, exert corporate control, facilitate risk management, and ease trading of goods, services and contracts in the third stage. Lastly, King and Levine assumed that the two key *channels for economic growth* are capital accumulation and technological innovation.

According to Levine, *on technological innovation*, growth models focuses on the innovation of new production processes and goods (Romer, 1990, Grossman et al., 1991). *On capital accumulation*, growth models uses either capital externalities or capital goods produced using constant returns to scale (Romer, 1986, Lucas, 1988). In these models, the functions performed by the financial system affect steady state growth by influencing the rate of capital formation (Levine, 1997, pp.691). Levine argued that the financial system affects *capital accumulation* either by altering the saving rate or by reallocating savings among different capital producing technologies (Levine, 1997, pp.691).

This paper's empirical analysis is based on King and Levine's model (Levine, 1997, 2004), and estimates the ratio of private sector credits to GDP (*PRIVY*) and the ratio of liquid liabilities to GDP (*DEPTH*) for financial sector development. The full sample includes 112, low income and lower middle income group includes 67, and upper middle and high income group includes 45 countries respectively. Most of studies have been using the DEPTH[4] or the PRIVY in order to measure the financial sector development for their analyses.

The DEPTH indicator measures the size of financial intermediaries in the country, and is defined by the ratio of liquid liabilities of the financial system, (money and quasi money (M2)), to the GDP.

$$DEPTH = \frac{\text{Liquid Liabilities}}{\text{GDP}} \tag{1}$$

The PRIVY indicator measures the total credit which was provided to private enterprises, and is defined by the ratio of private sector credits to the GDP.

$$PRIVY=\frac{\text{Private Sector Credit}}{\text{GDP}} \quad (2)$$

The estimated model

$$G(j) = \alpha + \beta F(i) + \gamma X + \varepsilon \quad (3)^{5}$$

- $G(j)$ represents the value of the j th economic growth indicator;
- $F(i)$ represents the value of the i th indictor of financial sector development averaged over the period;
- X represents a matrix of variables which control for other factors associated with economic growth such as income per capita, education, political stability, exchange rate, trade, fiscal, monetary policy, etc.
- ε represents a disturbance term.

The empirical model of per capita GDP growth rate is given:

$$Growth_i = \alpha + \beta_1 Depth_i + \gamma_1 InGDP_i + \gamma_2 Edu_i + \gamma_3 Gov_i + \gamma_4 Cpi_i + \gamma_5 Open_i + \gamma_6 FDI_i + \gamma_7 Save_i + \varepsilon \quad (4)$$

- Growth is the five-year average growth rate of real per capita GDP;
- Subscript i represent each country among *n* countries in total sample;

The following section discusses the finding on studies conducted to examine the relationship between growth rate and such factors as initial per capita GDP, education, government expenditure, trade openness, etc.

Initial Per Capita GDP

Sala-i-Martin et.al (2004) used data collected by Heston et.al (2001) and utilized the *initial level of per capita GDP* to test the conditional convergence, which has a significant impact on economic growth. A number of studies conducted by Barro and Lee (1994), Sala-i-Martin and Barro (1992), Ben-David (1993, 1996), Levine (1997), and Romer (1993) found that initial level of per capita GDP has a negative and statistically significant relationship with economic growth.

Education Enrollment

Barro (1991) found the growth rate of real per capita GDP is positively related to initial human capital (by 1960 school enrolment rates) and negatively related to the initial (1960) level of real per capita GDP. " The poor countries tend to catch up with rich countries if the poor countries have high human capital per person. " (Barro, 1991, pp.437). The studies conducted by Levine et.al (1997), Knowles et.al (1995) found that the overall education level indicator has a positive and statistically significant impact on economic growth.

Government Expenditure

The ratio of expenditures on government consumption to GDP (Barro and Lee, 1993) has a negative association with economic growth. " The public consumption[6] does not tend to contribute to growth directly, but it needs to be financed with distortion taxes which hurt the growth rate. " (Sala-i-Martin et al., 2004, pp.829) Barro and Lee (1994), Levine et al. (1992), Sachs et al. (1995), and Sala-i-Martin, (1997) also found that government consumption has a statistically significant and negative impact on economic growth.

Consumer Price Index

Bruno and Easterly (1995), Fisher (1993), Levine and Renelt (1992), and Barro (1997) found that inflation has a negative impact on economic growth. However, some of these results do not show robust impacts. Allen et.al (1998) argued that high inflation distorts economic activity and reduces investment in productive enterprises, which reduces economic growth.

Trade Openness

Romer et al. (1996) found that one percent rise in the trade openness increases income per capita by two percent or more. Authors mentioned that trade allows countries to specialize in accordance with comparative advantages and it can affect the technological level. Openness reflects not only the influence of policy-induced distortions (trade protection, capital control) but also influence of natural distortions arising from size (Berthelemy et al., 1996, pp. 310).

Foreign Direct Investment

Hermes and Lensink（2003）found that FDI helped increase growth by introducing new technologies, such as new production process, techniques, managerial skills, ideas, and new varieties of capital goods. In new growth literature, the importance of technological change for economic growth has been emphasized.（Grossman and Helpman, 1991; Barro and Sala-i-Martin, 1995）

Gross Domestic Savings

Dornbusch and Reynoso（1989）observed that increased real deposit rates promote economic growth. According to them, higher real interest rates rise domestic savings and hence increase the available supply of resources for investment. Dornbusch and Reynoso also mentioned that economic growth occurs through the quality of investment（Dornbusch and Reynoso, 1989, pp.206）.

Data and Methodology

The empirical analysis in this paper relied on three main data sources to estimate the financial sector development and long-run economic growth dynamics. The data on DEPTH and PRIVY, the financial sector development indicators, are obtained from the International Financial Statistics, CD-ROM 2005. The data on secondary school enrolment rate is obtained from Barro and Lee's dataset（2002）. The other variables are obtained from the World Development Indicators, CR-ROM 2005.

i. *Depth*= The ratio of the liquid liabilities to GDP;
ii. *Privy* = The ratio of private sector credits to GDP;
iii. *InGDP* = The Initial Per Capita GDP, in logarithms;
iv. *Edu* = Secondary School Enrolment Rate in the gross enrolment;
v. *Gov* = The ratio of Government Expenditure to GDP;
vi. *Cpi* = The Consumer Price Index;
vii. *Open* = The ratio of export plus import to GDP, trade openness;
viii. *FDI* = The ratio of Foreign Direct Investment（FDI）to GDP;
ix. *Save* = The ratio of Gross Domestic Savings to GDP;

The methodology of the empirical analysis depends on the substantial literature, in which growth regression is undertaken by Lucas (1988), Romer (1990), Barro (1991), Beck et.al (2000), Levine and King (1993) and Levine (2004).

The analysis is conducted using five-year averaged panel data set because it has a number of advantages. " A panel provides more precise estimates of the finance growth relationship. " (Levine, 2004, pp. 54) Panel analysis also avoids biases associated with cross country regression (Levine, 2004). To analyze more specific country cases, the countries are divided into the two income groups according to the World Bank classification of 2005.

Low and lower middle income group:

- Low income countries of GNI per capita of $765 or less and lower middle income countries of GNI per capita of $765 to $3,035 in 2003.

Upper middle and high income group:

- Upper middle income countries of GNI per capita of $3,036 to $9,385 and high income countries of GNI per capita greater than $9,385 in 2003.

The reason to include two income group countries is to increase the number of observations that can be estimated with fixed effect methods.

IV. Results and Interpretations

The estimates were carried out using five-year panel data from 1970 to 2003 with fixed effects estimations. The purpose of this analysis is to empirically investigate the hypothesis that financial sector development has a significant and positive impact on the growth rate of the economy.

Presented below are authors 'findings for each indicator. Overall these results are consistent with those of other researchers ' findings.

The Result of Full Sample

Table 1 presents the results of regressions using the full sample of 112 countries[7]. The results of full sample regressions (1)-(5) show that financial sector development indicators, (*DEPTH and PRIVY*), have a significant and predicted positive impact on economic growth at 5 percent significant level. The coefficient of *PRIVY* (reg.1)

shows that a 10 percentage point increase in Privy increases growth rate by 0.31 percentage point in the period of 1970 to 2003. It is quite a big impact on economic growth which leads to the conclusion that the financial sector development is an important aspect to economic growth.

Initial Per Capita GDP and Government Expenditure

The full sample regression results show that *the initial per capita GDP* and the *government expenditure* explanatory variables have statistically significant and negative impacts on economic growth. The coefficients of the initial per capita GDP (reg.3) and the government expenditure show that a 10 percentage point increase in these variables decreases economic growth by 1.06 and 4.49 percentage point respectively.

Trade Openness and Foreign Direct Investment (FDI)

Other explanatory variables, *trade openness, and FDI* have statistically significant and positive impacts on economic growth. The coefficient of the openness (reg.4) shows that a 10 percentage point increase in the trade openness increases economic growth by 0.24 percentage point. This means that more the trade openness more the economic growth.

Gross Domestic Savings

Dornbusch et.al (1989) argued that more savings give more opportunity for future investment which can promote economic growth. Furthermore, studies by Hermes et al. (2003), Grossman et al. (1991), and Barro and Sala-i-Martin (1995) also found that new technology and know-how are the fruits of well functioned and efficiently used FDI in the economy.

In the case of the gross domestic savings, regression (5) shows that a 10 percentage point increase in the saving increases growth by 0.25 percentage point. The results of theoretical and empirical research suggest that trade openness, FDI, and gross domestic savings can affect the technology level, which leads to economic growth.

Table 1. Financial sector development and economic growth

Dependent variable: Growth Rate of Per Capita GDP					
Regression No	(1)	(2)	(3)	(4)	(5)
		Full	Sample		
Privy	0.031564		0.033526		0.029082
	(3.703912)*		(3.749764)*		(3.648642)*
Depth		0.033829		0.023841	
		(2.114763)*		(1.732379)**	
Initial Per capita GDP	−0.115259	−0.105123	−0.106442	−0.100566	−0.103898
	(−6.024264)*	(−5.133504)*	(−5.480492)*	(−5.524133)*	(−6.0028)*
Education	−0.000291	−0.002438	−0.002124	0.00208	0.002397
	(−0.124254)	(−0.962392)	(−0.898765)	(0.939853)	(1.149734)
Government expenditure	−0.379614	−0.51869	−0.449977	−0.449415	−0.419745
	(−2.082715)*	(−2.585994)*	(−2.354494)*	(−2.618378)*	(−2.540298)*
CPI	−0.000128	−0.000783	−0.000629	−0.000161	−0.000278
	(−0.098921)	(−0.535911)	(−0.457573)	(−0.133034)	(−0.241921)
Openness	0.019153	0.01723	0.020801	0.024297	0.024466
	(1.990479)*	(1.543515)	(2.033838)*	(2.425564)*	(2.642253)*
FDI	0.149377	0.188644	0.177561		
	(4.636124)*	(5.389921)*	(5.380296)*		
Saving	0.021509			0.025843	0.025148
	(2.984009)*			(3.928402)*	(3.928402)*
Periods	(1970-2003)	(1970-2003)	(1970-2003)	(1970-2003)	(1970-2003)
R squares	0.573519	0.52827	0.546626	0.51877	0.535674
No. observations	290	288	303	322	336

t statistics in parenthesis

* significant at 5 percent level

** significant at 10 percent level

The Results of Low Income and Lower Middle Income Countries

Table 2 presents the results of regressions for the low and lower middle income countries. The financial sector development indicators, *PRIVY* and *DEPTH*, have robust, statistically significant and positive impacts on economic growth. The coefficient of the depth (reg.6) shows that a 10 percentage point increase in the ratio of the liquid liabilities to GDP increases the economic growth by 0.38 percentage point. The *PRIVY* entered 5 percent significant level to economic growth in low and lower middle income countries.

Initial Per Capita GDP and Government Expenditure

The initial per capita GDP and government expenditure still registered a negative impact and robustly entered at 5 percent significant level to growth. Moreover, Jeffrey (1997) confirmed that large budget deficits or heavy tax burdens might retard growth. For instance, government borrowing can crowd out private capital accumulation. Also, unbalanced government fiscal policy might be a symptom of other related problems such as an overall lack of good governance that could adversely affect a country's productivity growth.

Trade Openness, Foreign Direct Investment and Gross Domestic Savings

Trade openness, FDI and gross domestic savings have a robust and positive correlation with economic growth. The estimated regression (8) shows that a 10 percentage point increase in openness, FDI, and savings increase economic growth by 0.38, 1.29, and 0.15 percentage point respectively. The results are consistent with Romer et al. (1996), Grossman and Helpman (1991), and Barro and Sala-i-Martin (1995)'s findings.

Jeannine (2000) argued that the domestic financial sector plays a pivotal role in ensuring that international capital flows do indeed promote economic growth in developing countries. "The capital inflows foster higher economic growth, above and beyond any effects on the investment rate, but only for economies where the banking sector has reached a certain level of development." (Jeannine, 2000, pp.15)

Table 2. Financial sector development and growth

(Dependent variable: Growth rate of Real Per Capita GDP)						
Regression No	(6)	(7)	(8)	(9)	(10)	(11)
	Low Income and Lower Middle Income Countries					
Privy		0.030969	0.030565			0.028272
		(2.740701)*	(2.820095)*			(2.853144)*
Depth	0.038182			0.024445	0.027359	
	(2.424936)*					
				(2.476824)*	(1.956358)**	
Initial per	−0.126818	−0.132738	−0.136834	−0.092037	−0.139641	−0.114812
Capita GDP	(−6.278754)*	(−5.228546)*	(−5.369823)*	(−5.112525)*	(−7.343267)*	−4.968024)*
Education	−0.000196	−0.002359	3.67E-05	0.001596	0.001818	0.002264
	(−0.078746)	(−0.693437)	(0.010541)	(0.73467)	(0.836321)	(0.78571)
Government	−0.815255	−0.732459	−0.619973	−0.654213	−0.646719	−0.508404
expenditure	(−6.413056)*	(−3.103099)*	(−2.723953)*	(−6.931858)*	(−5.745178)*	(−2.52446)*
CPI	−0.001535	−0.000382	−1.97E-05	−5.75E-05	−0.000783	−0.000555
	(−1.341516)	(−0.218923)	(−0.011936)	(−0.045278)	(−0.75842)	(−0.36195)
Openness	0.041132	0.039467	0.038836	0.051621	0.042436	0.042197
	(3.033516)*	(2.428354)*	(2.49798)*	(4.790134)*	(3.681702)*	(2.84791)*
FDI	0.1532	0.16925	0.12926		0.119622	
	(5.296941)*	(4.172612)*	(3.204429)*		(5.635172)*	
Saving			0.015444	0.020104	0.023169	0.019803
			(2.098223)*	(5.460621)*	(4.064207)*	(3.028977)*
Sample	1970-2003	1970-2003	1970-2003	1970-2003	1970-2003	1970-2003
R square	0.484595	0.506576	0.528105	0.428001	0.500236	0.448903
No. observations	210	213	201	216	198	238

t statistics in parenthesis
* significant at 5 percent level
** significant at 10 percent level

The Results of Upper Middle and High Income Countries

Regressions (12) to (14) in Table 3 present results for upper middle and high income 45 countries. The *PRIVY* and *DEPTH*, financial sector development indicators, have significant impacts on economic growth in these group sample countries. The coefficient of DEPTH (reg.13) shows that a 10 percentage point increase leads to increases in economic growth by 0.69 percentage point.

Furthermore, the initial per capita GDP has a significant and negative impact on economic growth. This explanatory variable has a strong robust and negative impact on economic growth for all estimated regression results.

Table 3. Financial sector development and growth

(Dependent variable: Growth rate of Real Per Capita GDP)

Regression. No	(12)	(13)	(14)
	Upper Middle and High Income Countries		
Privy	0.025759 (1.721216)**		0.044095 (2.307620)*
Depth		0.069220 (1.701809)**	
Initial per capita GDP	−0.089391 (−2.732958)*	−0.102674 (−2.041087)*	−0.092284 (−2.723097)*
Education	−0.002025 (−0.612886)	−0.001670 (−0.387763)	0.001748 (0.480662)
Government expenditure	−0.204531 (−0.574201)	0.086084 (0.133740)	−0.529016 (−1.449839)
CPI	0.002454 (1.057373)	0.002204 (0.726320)	0.002061 (1.045930)
Openness	0.016954 (1.299109)	0.003642 (0.193925)	0.007654 (0.526619)
FDI			−0.013933 (−0.569035)
Saving	0.173745 (3.027800)*	0.238099 (2.429240)*	
Periods	1975-2003	1970-2003	1970-2003
R square	0.524504	0.602553	0.567454
No. observations	104	71	95

t statistics in parenthesis
* significant at 5 percent level
** significant at 10 percent level

Regression (12) and (13) show the gross domestic savings has a positive and significant impact on economic growth. The coefficient of DEPTH (reg.13) shows that a 10 percentage point increase in the ratio of liquid liabilities to GDP increases the economic growth by 0.69 percentage point per year. This result supports Dornbusch and Reynoso's (1989) well-known findings. These empirical findings support the investigated hypothesis that the financial sector development significantly and positively affects the economic growth of different income group countries. Financial sector development can help developing countries by increasing the economic growth. It can also help developed countries sustain the achieved growth.

V. Conclusion

This paper re-examines the link between financial sector development and economic growth. It reviews the literature on this subject. Moreover, this paper conducts empirical analysis for 112 countries to study the nexus between financial sector development and economic growth. The empirical study investigates the hypothesis that financial sector development has a significant and positive impact on the economic growth rate of a country. The major findings of this study are as follows:

As outlined in a number of studies, a well developed financial system can reduce the information and transaction costs, increase the saving rates and the investment decisions, enhance technological innovation, and contribute to the long-run economic growth.

The *DEPTH* (to measure the size of financial intermediaries) and *PRIVY* (to measure the allocation of credits in the market) are the main indicators of financial sector development in all stages of economic development.

The empirical analyses show the evidence that *financial sector development* has a positive and significant impact on *economic growth*. The results of regression analysis for *full sample* analysis (112 countries) show that financial sector development indicators, *DEPTH, and PRIVY*, have the predicted positive signs at the 5 percent level of significance. The coefficient of *PRIVY* shows a 10 percentage point increase in *PRIVY* increased economic growth by 0.31 percentage point during the period of 1970 to 2003 for the countries studied in this paper.

The results of the regression analysis *for the low and lower middle income countries* (low income countries of GNI per capita of $765 or less and lower middle income countries of GNI per capita of $765 to $3,035 in 2003) show that the financial sector development indicators, *PRIVY* and *DEPTH*, have robust, significant and positive impacts on economic growth. The coefficient of DEPTH shows that a 10 percentage point increase in the ratio of liquid liabilities to GDP increases economic growth by 0.38 percentage point.

The results of the regression analysis for *the upper middle and high income countries* (upper middle income countries of GNI per capita of $3,036 to $9,385 and high income countries of GNI per capita greater than $9,385 in 2003) also confirmed that the *PRIVY* and *DEPTH*, are robustly significant at 5 and 10 percent level and

show a positive impact on economic growth. The coefficient of *DEPTH* shows that a 10 percentage point increase leads to increases in economic growth by 0.69 percentage point.

Although this study focused on financial sector development, some other interesting results were found for all estimated regressions which support the findings of other researchers. First, *the initial per capita GDP* and the *government expenditure* explanatory variables have statistically significant and negative impacts on economic growth. Secondly, *trade openness, and FDI* variables have statistically significant and positive impacts on economic growth. On the *gross domestic savings*, a 10 percentage point increase in the savings enhances economic growth by 0.25 percentage point. These findings lead to conclude that *trade openness*, *FDI*, and *gross domestic savings* can affect the technology level and capital accumulation, which drives to economic growth.

Although some economists have found important evidences, this topic needs more research on financial structure and its effect on economic growth. Specifically, it needs a more specific analysis on how market and bank based on financial structure lead to economic growth.

Notes

1 The size of financial intermediaries, DEPTH, ratio of liquid liability and GDP; BANK, the degree to which the central banks in contrast to commercial banks are allocating credit. PRIVATE, the ratio of private sector credit to total credit; PRIVY measures the ratio of private sector credit to GDP;
2 Growth rate of real capita GDP; Growth rate of capital stock per capita and Total factor productivity growth;
3 The regression sample included eight Southern Africa countries as well as Botswana, Lesotho, Mauritius, Malawi, Swaziland, South Africa, Zambia, and Zimbabwe.
4 Many researchers have been using the LIQUID LIABILITY or CREDIT indicators which have a same definition with the DEPTH and PRIVY from Levine.
5 The estimated equation was firstly tested by King and Levine (1993).
6 Some authors refer to public consumption instead of the government expenditure;
7 Name of sample countries listed in appendix 1.

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APPENDIX 1 List of countries included in the empirical analysis

HIGH INCOME AND UPPER MIDDLE 45 COUNTRIES

1. Australia
2. Bahrain
3. Canada
4. Cyprus
5. Denmark
6. Finland
7. France
8. Germany
9. Hong Kong, China
10. Iceland
11. Ireland
12. Israel
13. Italy
14. Japan
15. Korea
16. Kuwait
17. Mali
18. New Zealand
19. Norway
20. Singapore
21. Sweden
22. Switzerland
23. United Arab Emirates
24. Unites States
25. Argentina
26. Barbados
27. Belize
28. Botswana
29. Chile
30. Costa Rica
31. Dominica
32. Gabon
33. Hungary
34. Latvia
35. Malaysia
36. Mexico
37. Oman
38. Panama
39. Saudi Arabia
40. Seychelles
41. St. Kitts and Nevis
42. St. Vincent and the Grenadines
43. Trinidad and Tobago
44. Uruguay
45. Venezuela

LOW AND LOWER MIDDLE INCOME 67 COUNTRIES

1. Bangladesh
2. Benin
3. Burkina Faso
4. Burundi
5. Cameroon
6. Central African Republic
7. Chad
8. Congo, Dem.Rep
9. Congo, Rep
10. Cote d'Ivoire
11. Gambia
12. Ghana
13. Guinea-Bissau
14. India
15. Kenya
16. Lesotho
17. Liberia
18. Madagascar
19. Malawi
20. Malta
21. Mauritania
22. Nepal
23. Nicaragua
24. Nigeria
25. Pakistan
26. Papua New Guinea
27. Rwanda
28. Senegal
29. Sierra Leone
30. Solomon Island
31. Sudan
32. Suriname
33. Swaziland
34. Togo
35. Zambia
36. Zimbabwe
37. Algeria
38. Bolivia
39. Brazil
40. Chile
41. Colombia
42. Dominican Republic
43. Ecuador
44. Egypt. Arab Republic
45. El Salvador
46. Fiji
47. Guatemala
48. Guyana
49. Honduras
50. Indonesia
51. Iran, Islamic Rep
52. Jamaica
53. Jordan
54. Morocco
55. Paraguay
56. Peru
57. Philippines
58. Samoa
59. South Africa
60. Sri Lanka
61. Suriname
62. Swaziland
63. Syrian Arab Republic
64. Thailand
65. Tunisia
66. Turkey
67. Uruguay