Financial Deepening on Economic Growth and Productivity in Sub-Saharan Africa

YaAwa Jallow[a]

Abstract:

This paper investigates impact of financial deepening on economic growth and productivity in sub-Saharan Africa. The study uses variables from various studies that are said to most likely impact economic growth and productivity in a country. This study uses a Panel Data analysis to examine the impact of these variables especially financial deepening on both economic growth and productivity. The fixed effect and random effect model both suggest that overall financial deepening has a positive impact on economic growth in sub-Saharan Africa. The study also suggest that financial deepening has a positive effect on productivity in sub-Saharan Africa.

JEL Classification: O4, 05, G1

Keywords: Financial Development, Economic Growth, Productivity.

Bryant University, 1150 Douglas Pike, Smithfield, RI 02917. Phone: (617)319-8793 Email: yjallow@bryant.edu

1.0 Introduction:

Financial development according to the world economic forum is the factors, policies, and institutions that lead to effective financial intermediation and markets, as well as deep and broad access to capital and financial services. The global financial crisis of 2008 therefore shows how important financial markets are when it comes to economic development. To understand financial development however one needs to break financial development into two components; financial depth and financial sophistication. Financial depth can be simply defined as the size of financial intermediaries in an economy, whilst financial sophistication is defined as the act of creating and popularizing new financial instruments as well as new financial technologies, institutions and markets (Tufano 2002). There are seven pillars of financial development according to the world economic forum; Institutional Environment: this involves the general laws, regulations and supervision of the financial sector in a country. It also includes the quality of enforcement contract and also corporate governance. Business Environment: this includes human capital and the state of physical capital. Human capital, which measures the amount of individuals in the labor force who can work in the financial sector and also provide sound financial services. The latter measuring the physical and technological infrastructure. Financial Stability: This addresses the stability of the finance sector. This is integral in financial development, because it determines if international organizations or companies will invest in a particular country. Banking Financial Services: this captures financial information and lowering transaction cost. Non-Banking Financial Services: such as broker dealers, traditional asset managers, alternative asset managers, and insurance companies. Financial Markets: these include the bond market; including both government and corporate bonds, the foreign exchange market, derivatives markets and also the stock markets. The final pillar of financial development is Financial Access. This last pillar span measures of access to capital through both commercial and retail channel (Robini et al. 2009). All these pillars of financial development therefore can be used as proxies to measure the level of financial development in a country.

Overall financial development's impact on economic growth has been widely researched by a number of scholars over the past two decades. Most of the studies agree that there is a positive relationship between financial development and economic growth. However, some still disagree and conclude that there is a negative relationship between the two factors. Withstanding the numerous studies of this causality, none of those studies focuses on Sub-Saharan Africa in particular. This paper will therefore run a fixed effect and random effect models, along with a hausman test. The results from models will be compared to the results of French Sub-Saharan Africa and British Sub-Saharan Africa. This paper therefore contributes to the literature body by determining the impact financial deepening has on both economic growth and productivity in Sub-Saharan Africa.

The rest of the paper is organized as follows: Section two gives a literature review, section three shows the trends of some of the independent variables used in this study, such as GDP growth and FDI. Section four includes the data and empirical model used in this study. Section five shows and discusses the empirical results, and section six gives the conclusion to this paper.

2.0 Literature Review

Stock markets and banks are substitute sources for corporate finance, because when a firm issues new equity it borrows less from banking systems. Arestis et al. (2001) used

time series data from five developed countries to find the long run relationship between stock market volatility, stock market development, banking system development, and the level of output. They also investigated the causal relationship between output and banking system development, and also the relationship between output and stock market development. They found that stock markets and banks do in fact contribute to output growth in three of the five countries used in their studies (France, Germany and Japan). However the results for United States and the United Kingdom appears to be weak. Their studies noted that bank based financial systems contribute more to long-term growth than capital-market based ones. Finally stock market volatility was either found insignificant in some countries, or had a negative effect on both financial development and output in some of the countries (Arestis et al. 2011).

Deepening financial development generally leads to increases in the level of and returns to investment in many economies but this wasn't true for China according to Lu and Yao (2004). They concluded that there financial development did not have a statistically significant impact on economic growth. Zhang et al. (2007) determine how much total outstanding bank loan was granted to state and non-state sectors. That measure was then constructed as the ratio of credit for the non-state sector to GDP, and was therefore used as a proxy for financial deepening. A positive relationship between financial deepening and productivity growth was found (Zhang et al. 2007)

Gregoria and Guidotti (1995) suggested that most past research used the level of real interest rates to measure financial development in a country, however this measurement poses significant problems of interpretation. They therefore employed the ratio of bank credit to private sector to GDP as a proxy for financial development. It was noted that this is a better proxy than the real interest rate because this proxy represents the actual amount of funds directed to the private sector, hence it is more related to investments and economic growth. The paper suggested that financial development does broadly have a positive relationship with economic growth, the result however changes due to factors like region, time, period and levels of income. It was therefore concluded that there is a positive relationship between financial development and economic growth in low and middle income countries, but the result was negative in high income countries. The effect of financial intermediation on growth was due mainly to its impact on the efficiency rather than its volume. The paper finally suggested that the negative relationship between financial intermediation and economic growth in Latin America was due to the extreme experiments of financial liberalization that occurred in Latin America in the 1970s and 80s (Gregoria and Guidotti 1995).

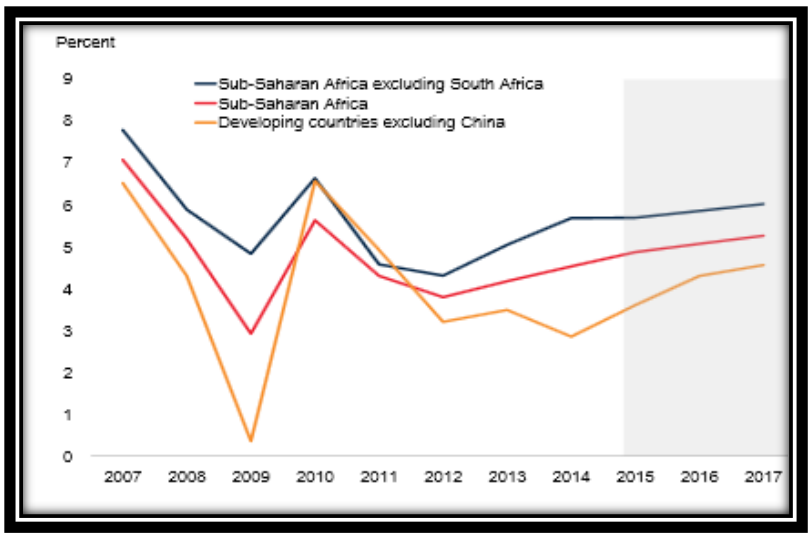
Alfaro et al. (2004) examines the relationship between foreign direct investments (FDI), financial markets and economic growth. The paper examines whether countries with better financial systems gain more FDI than countries with the least financial development. FDI as a share of GDP was used as a proxy for financial development. The paper suggested that lack of development of local financial markets can limit the economy's ability to take advantage of potential FDI spillovers thus deter or reduce economic growth. The empirical evidence suggests that FDI plays an important role in economic growth. However for the relationship between FDI and economic growth to be positively observed, the level of financial development should be put into account (Alfaro et al. 2004). The state of financial development reduces the cost of external finance to funds, thereby promoting growth (Rajan and Zingales 1998). Goldsmith (1969) argues that well-functioning financial markets lower

transaction costs, which allows capital to be allocated to projects that will yield the highest rate of return, thus boost economic growth. Goldsmith (1969) also suggest the demand-following hypothesis which suggest a causal relationship between economic growth and financial development. This hypothesis suggest that an increasing demand of financial services leads to an expansion in the financial sector as the economy grows. On the other hand, Patrick (1966) examines whether financial development leads to economic growth or if the latter actually leads to more financial deepening. This causality was labeled the supply-leading hypothesis, which suggests that financial deepening increases the supply of financial services which therefore leads to economic growth. Neusser and Kulger (1998) also support this hypothesis that financial development enhances economic growth through the supply of more financial services. These competing suggestions boosted Calderon and Lui (2003) to investigate these competing hypothesis. In general using pooled data of 109 countries, financial development was found to have a positive effect on economic growth. When these countries were divided into developing and industrial economies, the causality from economic growth to financial development and financial development to economic growth coexist. Therefore it can be seen from their results that financial deepening stimulates economic growth, the same way economic growth drives financial development. The effects of financial development does however take time to impact the real economy (Calderon and Lui 2003).

3.0 Trends:

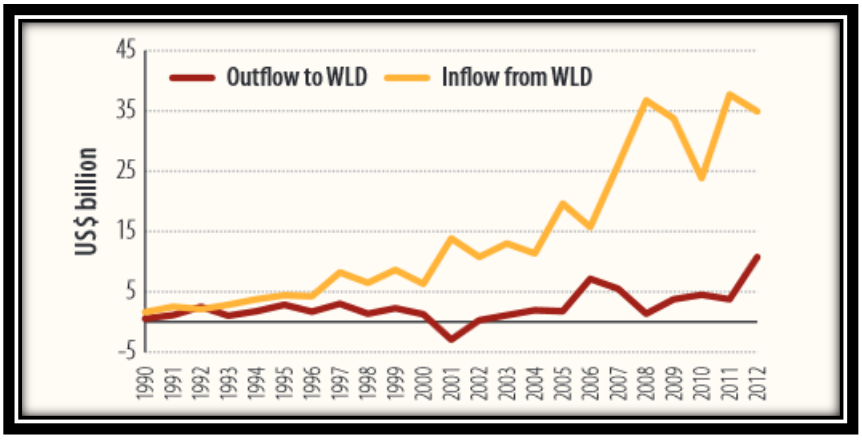
Figure 1 shows GDP growth in the sub-Saharan region. After continuous decline in GDP 2010 to 2012, GDP has steadily started to increase in this region. According to the World Bank, this is because of Investment in public infrastructure, increased agriculture production, and buoyant services. Sub-Saharan Africa is expected to have continuous GDP growth in the future, but poverty however still remains prevalent in that area. Figure 2 shows the inflow and outflow of Foreign Direct Investments in the sub-Saharan region. This is measured in billions US dollars. The chart shows how inflows have been steadily increasing since 1990, with little declines in some years after, but in 2006 there was a rapid increase in FDI inflows in sub-Saharan Africa, which was accompanied by a rapid decline in 2008. This decline can be due to the global economic crises in 2008. Inflows started increasing in 2010, and according to the United Nation Conference on Trade and Development (UNCTAD), Africa continues to be a fast growing place for FDI inflows, therefore we should expect an increase in FDI inflows in sub-Saharan Africa in the years to come.

Figure 1: GDP Growth in sub-Saharan Africa



Source: World Bank

Figure 2: FDI Inflows and Outflows in sub-Saharan Africa



Source: UNCTAD

4.0 Data and Emperical Model:

4.1 Data:

This study uses annual data from the years 2000 to 2013 across 12 countries (7 English speaking and 5 French speaking countries). The data was obtained from the world bank development indicators. All of the data is available publicly on The World Bank website. Tabe 1 shows the summary statistics of the data.

Table 1: Summary Statistics

Variables	Observations	Mean	Standard Diviation	Min	Max
FDP	168	28.21753	9.546211	9.010683	53.53846
FDI	168	8.59e+08	1.61e+09	-6.98e+07	8.84e+09
INFLATION	168	6.740476	5.792721	-1.050788	32.90541
EXCHRATE	168	463.1894	531.058	.5449192	2586.89
FSPND	168	13.88602	4.186259	3.587854	25.79397
EXP	168	.6038545	.1858019	.1752685	1.163513
GDPPC	168	4162.036	10006.03	155.4528	38556.34
Y	168	23.03843	1.149886	19.99416	25.93444
P	168	6.959673	1.349097	5.046342	10.55988

4.2 Emperical Models:

For this study, we will be using two models, one to determine the relationship between financial deepening and economic growth, and the second to determine the relationship between financial deepening and productivity.

Financial Deepening and Economic Growth

This model adopts Christopoulos and Tsionas (2003) model to find the relationship between financial development and economic growth, and was modified by adding exchange rates as an independent variable, because the exchange rate helps measure some components of the sixth pillar of financial development, which is the financial markets. The study also uses M2 as a percentage of GDP as a proxy to measure financial depth. Loayza et al. (2000) developed this measure as a proxy for financial development. In Christopoulos and Tsionas (2003) study they use output as a share of investment as a variable, but this study uses foreign direct investments instead.

The model can be written as follows:

$$Y_{it} = \beta_{0it} + \beta_1 FDP_{it} + \beta_2 FDI_{it} + \beta_3 Inflation_{it} + \beta_4 EXCHRATE_{it} + \mu_{it} \quad (i)$$

Y_{it} is the annual real output in country *I* at year *t*. We use log of GDP to measure output or economic growth. This will be the dependent variable for this model. The world development indicators define it as the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant 2005 U.S. dollars. There are also four independent variables in this model, first: FDP_{it} financial deepening or financial depth, second: FDI_{it} foreign direct investments, third: $INFLATION_{it}$, fourth: $EXCHRATE_{it}$ exchange rate. Each of these variables are measured in a given country *I* at time period *t.*

Financial Deepening and Productivity

For this model, this study adopts Zhang et al. (2007) model to find the relationship between financial deepening and productivity. The only difference between their model and the model used in this study is the measure for financial depth, otherwise deepening. Zhang et al. uses bank lending to none-state enterprise or GDP, whilst this study used M2 to GDP.

The model looks as follows:

$$P_{it} = \beta_{0it} + \beta_1 FDP_{it} + \beta_2 FSPND_{it} + \beta_3 EXP_{it} + \beta_4 GDPPC_{it} + \mu_{it} \quad (ii)$$

Pit is productivity, which is the dependent variable for this model. The study uses total the log of GDP per capita to as a proxy for productivity. The first independent variable: FDP_{it} measures financial deepening or financial depth, second *FSPND* is government expenditure, and the third variable *EXP* is the fiscal expenditure as a percentage of GDP. The fourth variable is the GDP per capita used to measure consumption. Appendix A shows the acronyms, descriptions and data sources for each of the variables mentioned above.

5.0: Empirical Results:

Table 2 shows the empirical result for financial deepening and economic growth under the fixed effect model. The results suggest a positive relationship between financial deepening and economic growth in both French and English speaking countries in sub-Saharan Africa. Under the fixed effect model, a 1% increase in financial deepening will increase economic growth by 0.016% in all countries, 0.0156% in French speaking countries, and 0.0139% in English speaking countries. The inflation variable was however the only variable with no significance in this model. Table 3 shows the results under the random effect model, and the result suggests that there is a positive relationship between financial deepening and economic growth. As mentioned in the fixed effect model, inflation is still insignificant in this model as well. In the random effect model a 1% in financial depth increases economic growth by almost the same percentages as the fixed effect model. Generally, in both models financial deepening seems to be highly significant. This therefore implies that the bigger and more the financial institutions, the more the economy of a country will grow.

Table 2

Regression for Financial Deepening and Economic Growth; fixed effect model:

Economic Growth			
	All Countries	***French Speaking Countries***	***English Speaking Countries***
Constant	22.40239*** (263.56)	22.82728*** (244.08)	22.39362*** (193.29)
FDP_{it}	0.0163924*** (7.34)	.0156907*** (8.46)	.0139724*** (4.11)
FDI_{it}	1.14e-10*** (8.39)	3.88e-11* (2.15)	1.17e-10*** (6.59)
$Inflation_{it}$	-.0005184 (-0.16)	3.88e-11 (0.51)	-.0019427 (-0.44)
$EXCHRATE_{it}$	.0001705 (1.56)	-.0005012*** (-4.82)	.0003792* (2.35)
Countries	12	5	7
Number of obs	168	70	98
R-squared	**0.5479**	**0.8383**	**0.5291**

Table 3

Regression for Financial Deepening and Economic Growth; random effect model:

Economic Growth			
	All Countries	***French Speaking Countries***	***English Speaking Countries***
Constant	22.40447*** (74.87)	22.82923*** (61.34)	22.39454*** (47.42)
FDP_{it}	0.0162856*** (7.26)	.0156462*** (8.54)	.0140064*** (4.09)
FDI_{it}	1.16e-10*** (8.50)	3.89e-11* (2.18)	1.19e-10*** (6.68)
$Inflation_{it}$	-0.0003594 (-0.11)	.0020211 (0.51)	-.0015963 (-0.36)
$EXCHRATE_{it}$	0.0001667 (1.54)	-.0005026*** (-4.89)	.0003595* (2.28)
Countries *Number of obs*	12 168	70 5	98 7
R-squared	**0.5479**	**0.8383**	**0.5290**

Table 4 shows the relationship between financial deepening and productivity under the fixed effect model. The result suggests that there is a positive relationship between financial deepening and productivity generally in all countries. However when only French speaking countries are regressed, financial deepening seem not to be happening in those countries. Even though it shows a negative relationship in these regions, the impact seems to be insignificant. The English speaking countries however still exhibit a positive relationship between deepening and productivity, with very high significance. In this fixed effect model, a 1% increase in financial deepening will increase the countries productivity by 0.006998%, and increase productivity by 0.0103068% in English speaking countries. Table 5 shows the results from the random effect model, and this model suggests that there is also a positive relationship between financial deepening and productivity across all countries. French speaking countries however still show a negative relationship, similar to the fixed effect model, however this time around financial deepening is significant in the model. This random effect model suggests that, a 1% increase in financial deepening will increase the countries productivity by 0.0063235%, decrease productivity in French speaking countries by 0.0087936% and increase productivity in English

speaking countries by 0.0103068%. GDP per capita is insignificant in the random effect model for French countries, but has a significant impact in the fixed effect model, and is also significant in English speaking countries.

Table 4

Regression for Financial Deepening and Productivity; fixed effect model:

Productivity			
	All Countries	***French Speaking Countries***	***English Speaking Countries***
Constant	6.417233*** (72.87)	7.651881*** 129.33	5.65966*** (64.15)
FDP_{it}	0.006998*** (5.20)	-.0007112 -0.71	0.0103068*** (5.54)
$FSPND_{it}$	0.4105749*** (9.38)	.462088*** 7.41	0.4162249*** (7.93)
EXP_{it}	-9.101427*** (-9.41)	-10.57757*** -7.47	-9.167302*** (-7.90)
$GDPPC_{it}$	0.0000336*** (1.86)	4.14e-06 0.73	0.0001656*** (4.16)
Countries	12	70	98
Number of obs	168	5	7
R-squared	**0.5190**	**0.7569**	**0.6496**

Table 5

Regression for Financial Deepening and Productivity; random effect model:

Productivity			
	All Countries	***French Speaking Countries***	***English Speaking Countries***
Constant	6.281194***	7.337512***	0.0092664***
	(27.37)	(45.33)	(4.51)
FDP_{it}	0.0063235***	-0.0087936**	0.3719048***
	(4.69)	(-2.72)	(7.82)
$FSPND_{it}$	0.3886845***	-0.7005773***	0.3719048***
	(8.92)	(-3.83)	(-7.82)
EXP_{it}	-8.590911***	15.65108***	-8.068712***
	(-8.94)	(3.93)	(-7.69)
$GDPPC_{it}$	0.0000698***	0.0000932***	0.0003299***
	(4.98)	(31.51)	(11.60)
Countries	12	70	98
Number of obs	168	5	7
R-squared	**0.5074**	**0.4042**	**0.6116**

Note: *** denotes 99% significance, ** 95% significance, and * 90% significance. The numbers in parentheses are the z and T scores.

Hausman Test:

The hausman test suggested that fixed effect model is a better estimation for both our models. To explain this model in more detail lets go back to the first model which tries to find the impact of financial deepening on economic growth. The result shows that there is a positive relationship between financial deepening and economic growth. Meaning as financial development increase in a country so does economic growth. FDI also seemed to have a positive impact on economic growth, and this result seems to be consistent with past literature, which suggests that more FDI inflows in one country increases economic growth substantially. Inflation has a negative impact on all countries, however when countries are separated to British and French colonies, a negative and positive relationship was found respectively. The result however were insignificant and this might be due to the fact that inflation has not been happening in most parts of Sub-Saharan Africa during the period of 2000 to 2013. With the exception of Zimbabwe which was not included in the countries chosen for this study. Exchange rate is insignificant when all countries are ran, however British colonies exchange rates has a positive impact on economic growth whilst their French counterpart has a negative impact. This might be due to the fact that exchange rates in British colonies are less volatile and thus more stable therefore increasing investments and in the long run economic growth.

The fixed effect model was also suggested by the hausman test for financial deepening and productivity. The results show that financial deepening was not significant in French Sub-Saharan Africa, however it was significant in all countries and in British Sub-Saharan Africa. This might be due to the fact that financial deepening is not happening in the French colony counties selected for this study. Also note these French colony countries are among the poorest countries in the Sub-Saharan region, and therefore enough and accurate information about their financial systems might not be present. Fiscal spending according to the study has a positive impact on productivity. This can be true because the more the government spends on public good and services, or on infrastructural development, the more jobs are thus created therefore productivity increases. Fiscal spending to GDP seemed to have a negative relationship with productivity. GDP per capita used to measure consumption has a positive impact on productivity in all three cases.

6.0 Conclusion:

As this study seeks to find the relationship financial deepening has on economic growth and productivity in sub-Saharan Africa. The hausman test suggested that we use fixed effect model, and evidence shows that there is positive relationship between financial deepening and economic growth. This suggests more financial systems and intermediaries in a country leads to more the economic grows for both French and English speaking countries. Foreign direct investment also seems play and integral role on economic growth. This study therefore suggest that to increase economic growth even at a faster rate, FDI inflows should increase economic growth in general. Financial deepening has a positive impact on productivity when all countries are regressed. However when the countries are separated into English and French speaking countries as mentioned earlier, financial deepening seemed to be insignificant and negative on productivity in French speaking countries. We can therefore conclude that to increase productivity in English speaking countries, financial deepening should be increased. In French speaking countries however it's either financial deepening is not happening or there is a negative relationship with it and productivity. These results are consistent with Christopoulos and Tsionas (2003) and Zhang et al. (2007) results.

This study however has some limitations. Firstly we used log of GDP per capita to measure productivity because that was the best we could get. Secondly, because of lack of available data for the sub-Saharan region, we could not control for education, which would have helped explained financial deepening even better, because it is captured in the second pillar of financial development, which measures human capital in the financial sectors.

Withstanding these limitations, the results show that financial deepening has an overall positive impact on both economic growth and productivity in the sub-Saharan region.

Appendix 1:

Acronym	Data Source	Description
FDP	World Bank	Financial Deepening: Money and quasi money comprise the sum of currency outside banks, demand deposits other than those of the central government, and the time, savings, and foreign currency deposits of resident sectors other than the central government.
FSPND	World Bank	Fiscal Spending: General government final consumption expenditure includes all government current expenditures for purchases of goods and services. It also includes most expenditures on national defense and security, but excludes government military expenditures that are part of government capital formation
FDI	World Bank	Foreign direct investment: are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments
INFLATION	World Bank	Inflation: as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly
EXCHRATE	World Bank	Exchange rate: Official exchange rate refers to the exchange rate determined by national authorities or to the rate determined in the legally sanctioned exchange market. It is calculated as an annual

		average based on monthly averages (local currency units relative to the U.S. dollar).
GDPPC	World Bank	GDP per capita: is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. The log of GDP per capita was used to measure productivity.
EXP	World Bank	Fiscal spending/GDP

Bibliography:

Arestis, P., Demetriades, A. and Luintel, K. (2001). Financial Development and Economic Growth: The Role of Stock Markets. *JSTOR* 33: 16-41.

Calderon, C., and Lui, L. (2003). The direction of causality between financial development and economic growth. *Journal of Development Economics* 72: 321-334.

Alfaro, L., Chanda, A., Kalemil-Ozcan, S. and Sayek, S. (2004). FDI and economic growth: the role of local financial markets. *Journal of International Economics* 64: 89-112.

Christopoulous, D., and Tsionas, E. (2003). Financial development and economic growth: evidence from panel unit root and cointegration tests. *Journal of Development Economics* 73: 55-74.

Lu, F., and Y. Yao (2004). Law, Financial Development and Growth under Financial Depression in China, *China Social Sciences* 1: 42-55.

Gregorio, J., and Guidotti, P. (1995), Financial Development and Economic Growth. *World Development* 23: 433-448.

Aghion, P., Bacchetta, P., Panciere, R. and Rogoff, K. (2009). Exchange Rate volatility and productivity growth: The role of financial development. *Journal of Monetary Economics* 56: 494-513.

Zhang, J., Wan, G. and Jin, Y. (2007). The financial Deepening-Productivity Nexus in China: 1987-2001. *World Institute for Development Economics Research* No. 2007/08.

Goldsmith, R.W. (1969). *Financial Structure and Development*, Yale University Press: New Haven.