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Financial Development and Economic Growth in Developing Countries: A New Empirical Evidence from Côte d'Ivoire

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Abstract

In this study, we concern mainly about the short and long-run relationship between economic growth and financial development. We use a multi-steps methodology, namely the Autoregressive Distributed Lag (ARDL) approach and the Vector Error Correction Model (VECM) approach to test this relationship in Côte d'Ivoire from 1980 to 2014. Following our results, we conclude that there is a unidirectional causal relationship, both long run and short run, between GDP per capita and financial development index in Côte d'Ivoire running from economic growth to financial development.

Keywords: Financial development; Economic growth; Autoregressive Distributed Lag; Vector Error Correction Model; Causality

JEL Classification: C32, G21, O11, O16, O40, O47

1. Introduction

Macroeconomic fundamentals and Finance are central to economic performance. For African countries, both can boost economic growth and lead it to more inclusive growth and less volatile growth. Over the past decades, economic growth in Sub-Saharan Africa registered the worst decline. Now it is rebounding by showing signs of recovery even the recovery remains weak.

The primary issue with growth is its determinants. In the case of African countries, while macroeconomic fundamentals have been driving growth and financial development has contributed to economic growth and reduced its volatility, finance is less developed than in other developing regions. Therefore, improvements in financial market and institutions seem to be an appropriate issue to deal with in order to catch up the full benefits of growth in the region. Our focus here is on the level of financial development for an effective growth.

The primary concern of this study is to define the virtues of financial development as leading growth. The study aims as well to make a contribution to the development of African countries by providing a new evidence from Côte d'Ivoire. Specifically, it analyzes the causal relationship between financial development and economic growth in the country.

The paper follows such organization: Section 2 provides a literature review. Section 3 describes the data. Section 4 specifies the model and describes the methodology applied in the paper. Section 5 analyzes the empirical results, and Section 6 provides conclusions and policy implications.

2. Literature Review

Since Schumpeter (1911) who emphasized the positive role of financial development on economic growth, the finance-growth nexus has remained an important issue of debate among academics and policymakers. The pioneering contributions on the relationship between economic growth (EG) and financial development (FD) dates back at least to Goldsmith (1969), McKinnon (1973), and Shaw (1973).

In the debate and academic research, an important set of economists agrees that there is a relation between finance and economic growth. However, they disagree about the direction of causality. The literature about the direction of causality may be classified under four hypotheses.

The first hypothesis is the conventional view of the supply-leading hypothesis. It argues that policies that move toward the development of financial systems lead to economic growth. McKinnon (1973), King and Levine (1993a), Levine et al. (2000), and Christopoulos and Tsionas (2004) support this argument.

On the other hand, Gurley and Shaw (1967), Goldsmith (1969), and Jung (1986) among other argue that the direction is from economic growth to financial development. This second classification follows the demand-following hypothesis according to which the economic growth increases demand for financial services that induces an expansion in the financial sector.

Other authors argue the third causal direction that is two-way. The hypothesis postulates that financial development (FD) and economic growth (EG) reinforce each other. FD supports EG and EG renders support to FD. Patrick (1966), Blackburn and Huang (1998) Khan (2001) and more recently, Swamy and Dharani (2018) established the two-way causal relationship (bidirectional causality) between growth and financial development.

The last one is the hypothesis of non-causality. Finance is dismissed as an "over-stressed" determinant of economic growth (Lucas, 1988). Finance is not even discussed in a collection of essays by the "pioneers of development economics" (Meier and Seers, 1984).

Studies on financial development (FD) and economic growth (EG) have employed different samples in empirical investigations. These empirical investigations can be classified into two major Groups: those studies that used cross-country growth regression methods and those studies that used the time series data of individual countries

Early studies of finance and growth (EG) were based on cross-country analysis. For instance, Goldsmith (1969), King and Levine (1993a, 1993b), De Gregorio and Guidotti (1995), Levine and Zervos (1998), and Ndikumana (2000) used cross-country analysis to study the relationship between financial development and economic growth.

On the other hand, it was to ameliorate a number of statistical problems with pure cross-country investigations. Demetriades and Hussein (1996), Luintel and Khan (1999) and Shan et al. (2001), using time-series techniques, found that the causality is bi-directional for the majority of countries in their sample.

While reviewing panel studies in that field about African countries, we found evidence for the three first hypotheses of causal relation. The recent study of Egbetunde and Akinlo (2015) shows evidence of long-run causality running from economic growth to financial globalization while those of Walle (2014) shows clearly evidence for the reverse. However a previous study on Sub-Saharan African countries reveals a bi-directional causality between financial development and economic growth (Fowowe, 2011).

Whatever the relationship between them, finance and economic growth nexus remains ambiguous as Taivan (2016) who indicated the evidence of all hypotheses in some countries among a sample of 16 Asian economies.

3. Data

Our dependent variable in this study in economic growth. To track, it we use the real *Gross Domestic Product* (GDP) per capita growth in annual percentage. The data are cited on Africa development indicators, form the World Bank.

The main independent variable on which our study is based is *financial development index*. We include also the real sector (Trade openness, Government size and Inflation) in the set of independent variables. Data on measure of financial development are the "*new Broad-based Index of Financial Development"* (Sahay et al., 2015) cited from the International Monetary Fund. While data on the real sector are cited on Africa development indicators, form the World Bank. The whole dataset is annual data of Côte d'Ivoire for 1980-2014. Table 1 shows the definition and description of the variables used in this paper.

Table 1. Data definition and description

Variable	Definition	Description
GDPPC	GDP per capita	Annual growth rate (%)
FDI	Financial Development Index	index ranges from 0 to 1 (0=weak to 1=strong)
INFL	Inflation	Inflation consumer price
TRADE	Trade openness	Trade (% GDP)
GOV_SIZE	Government Size	Expenditure (% GDP)

As the Figure 1 shows, the financial development in Côte d'Ivoire is weak with an index less than 0.2 from 1980 to 2014. The GDP growth in the country has shown an increasing trend since 1980 and reached 8.00% in 2013.

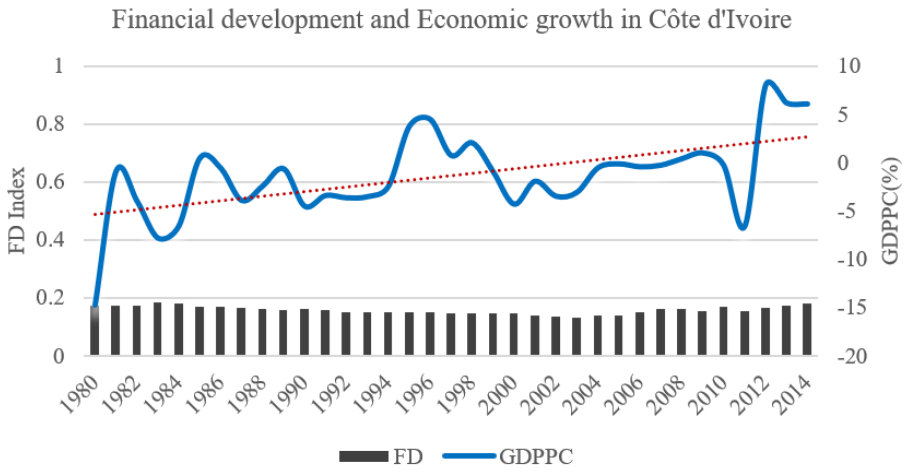

Figure 1. Financial development and Economic growth in Côte d'Ivoire

4. Model Specification and Methodology

The basic model used to carry out the study can be written as follows:

$$y_t = \alpha + \beta Z_t + \varepsilon_t$$

Where our response variable, *gross domestic product per capita,* is denoted y_t and Z_t a set of explanatory variables related to *financial development* and *real sector* and ε_t is the stochastic error term.

In this study, we concerned mainly about the causal short and long-run relationship between economic growth and financial development. The causal relationship between financial development and economic growth is followed as

$$GDP = f(FDI) \tag{1.1}$$

Where GDP is the real Gross Domestic Product per capita measuring economic growth and FDI the indicator of financial development.

We used a multi-steps methodology to test this relationship. First, we employed the Augmented Dickey–Fuller (ADF) (1979, 1981) and Phillips and Perron (1988) tests for checking the unit root hypothesis among the series. If this conventional unit root test fails to identify the presence of a structural break, if any, in the series, the Zivot and Andrews (1992) unit root test will be conducted to overcome this limitation. In another case, the Elliot et al. (1996) and Ng and Perron (2001) unit root tests should be also deployed to elicit the order of integration of all variables.

In the second step, we applied the Autoregressive Distributed Lag (ARDL) bounds testing approach to co-integration developed by Pesaran et al. (2001) in order to check both the short run and long run phenomena. The general form of ARDL follows as:

$$\Delta Y = \gamma_0 + \gamma_1 Y_{t-1} + \gamma_2 FDI_{t-1} + \gamma_3 X_{t-1} + \sum_{i=1}^{n} \tau_{1i} \Delta Y_{t-i} + \sum_{i=0}^{m} \tau_{2i} \Delta FDI_{t-i} + \sum_{i=0}^{p} \tau_{3i} \Delta X_{t-i} + \varepsilon_t \tag{1.2}$$

Where Y is the real GDP per capita, while the *FDI* set is the financial development index. X represents a vector of additional variables used as proxy of real sector.

The third step is to check the robustness of the co-integration test. We used the Gregory and Hansen, (1996) residual based test of co-integration to figure out the long run relationship between real GDP per capita, financial development and the other variables.

At the last step, the Vector Error Correction Model (VECM) Granger causality is being applied in this study. The VECM is helpful to estimate the coefficients for the short-term relationships as well as for the long-term relationships between financial development indicators and economic growth. The VECM equations are modeled as follows:

$$\Delta Y = \varpi_0 + \sum_{i=1}^{d} \varpi_{1i} \Delta Y_{t-i} + \sum_{i=0}^{e} \varpi_{2i} \Delta FDI_{t-i} + \sum_{i=0}^{f} \varpi_{3i} \Delta X_{t-i} + \lambda_1 ECT_{t-1} + \varepsilon_t \quad (1.3)$$

$$\Delta FDI = \theta_0 + \sum_{i=1}^{d} \theta_{1i} \Delta FDI_{t-i} + \sum_{i=0}^{e} \theta_{2i} \Delta Y_{t-i} + \sum_{i=0}^{f} \theta_{3i} \Delta X_{t-i} + \lambda_2 ECT_{t-1} + \varepsilon_t \quad (1.4)$$

where, λ_1 and λ_2 are the error correction term (ECT) coefficients.

5. Empirical Results

The results of unit root test displayed in Table 2 and 3 sum up that each of the time-series appear to support stationarity at first difference. Although the test statistics of the GDP per capita seem to suggest that it contains unit root according to the Ng-Perron unit tests. The ADF test concludes that it is stationary at both level and first difference.

Table 2. Augmented Dickey–Fuller, Phillips and Perron, Elliot et al unit root tests

	Augmented Dickey-Fuller		Phillips-Perron		Elliot et al.	
Variables	Level	First difference	Level	First difference	Level	First difference
GDPPC	-4.649586	-8.613465	-4.663761	-13.24417	12.38113	9.583521
FDI	-1.305626	-6.512071	-1.253742	-6.493915	9.419062	1.533794
INFL	-4.357219	-5.946316	-4.328641	-11.16023	4.545624	1.067239
TRADE	-1.420663	-4.926106	-1.539557	-4.926106	6.056513	1.675179
GOV_SIZE	-2.240556	-5.848386	-2.189066	-7.770010	5.275485	1.620365
1%	-3.639407	-3.646342	-3.639407	-3.646342	1.870000	1.870000
5%	-2.951125	-2.954021	-2.951125	-2.954021	2.970000	2.970000

Note: 1% and 5% are the levels of significance of the asymptotic critical values for each test statistics

Table 3. Ng and Perron (2001) unit root tests

	Level				First difference			
Variables	MZa	MZt	MSB	MPT	MZa	MZt	MSB	MPT
GDPPC	-6.92206	-1.62926	0.23537	4.29924	-1.37134	-0.74195	0.54104	15.6828
FDI	-2.86473	-1.11052	0.38765	8.30870	-16.1258	-2.81836	0.17477	1.59763
INFL	-11.8009	-2.35094	0.19922	2.37515	-16.0837	-2.83575	0.17631	1.52350
TRADE	-3.82058	-1.37821	0.36073	6.41484	-16.2991	-2.79762	0.17164	1.71277
GOV_SIZE	-6.58690	-1.70594	0.25899	4.07795	-16.4187	-2.85952	0.17416	1.51319
1%	-13.8000	-2.58000	0.17400	1.78000	-13.8000	-2.58000	0.17400	1.78000
5%	-8.10000	-1.98000	0.23300	3.17000	-8.10000	-1.98000	0.23300	3.17000

Note: 1% and 5% are the levels of significance of the asymptotic critical values for each of the four Ng–Perron test statistics

The result of Autoregressive Distributed Lag (ARDL) bounds testing approach to co-integration is shown in Table 4. The Calculated F-statistic is higher than the upper bound critical value at the 1% level. This result suggests that there is evidence for co-integration between the economic growth and financial development indicator. An important conclusion that may be drawn here is that a long run relationship exists between the economic growth and financial development in Côte d'Ivoire.

Table 4. Autoregressive Distributed Lag (ARDL) bounds test

Lag	F-statistic	
1	8.224701	
2	3.567793	
Significance	I(0)	I(1)
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49

1%	3.74	5.06

The results of the Gregory and Hansen residual based test of co-integration that examine cointegration which allow for the possibility of regime shifts are shown in table 5. The results rejects the null hypothesis of no cointegration. Hence, they suggest cointegrating or long-run relationship among the variables in the presence of structural breaks.

Table 5. Gregory-Hansen Test for Cointegration

	Statistic	Breakpoint	Date	Asymptotic Critical Values 1% 5%	
ADF	-8.48	22	2001	-7.31	-6.84
Zt	-8.99	18	1997	-7.31	-6.84
Za	-41.89	18	1997	-100.69	-88.47

Based on the previous results, we employ the Granger causality test within the VECM model to identify if there exists any causal relationship between financial development and GDP per capita in Côte d'Ivoire. The results are shown in table 6 and 7. Following these results, we conclude that there is unidirectional causal relationship between GDP per capita and financial development index in Côte d'Ivoire running from economic growth to financial development. While our main conclusion that growth causes finance in Côte d'Ivoire like Esso (2010), other studies found that financial development promotes growth in the same country (Egbetude and Mobolaji, 2010) or that there is no link between financial development and economic growth in Côte d'Ivoire (Aka, 2010). Moreover, the least square method and the Wald test employed on the cointegrated equation (See Appendix) show that the relationship is both long run and short run relationship. Indeed, the coefficient of the error correction term (ECT) is significant and negative. That implies the long run link. And the short run test via the Wald test is significant.

Table 6. Vector Error Correction Model (VECM) Granger causality

	d(GDPPC)	***d(FDI)***	***d(INFL)***	***d(TRADE)***	***d(GOV_SIZE)***
d(GDPPC)	-	9.305186***	1.242652	0.002776	0.172501
		[0.0023]	[0.2650]	[0.9580]	[0.6779]
d(FDI)	1.587451	-	1.212704	0.004644	2.793343*
	[0.2077]		[0.2708]	[0.9457]	[0.0947]
d(INFL)	3.461113*	4.895268**	-	0.269741	1.253673
	[0.0628]	[0.0269]		[0.6035]	[0.2629]
d(TRADE)	0.399108	1.032000	0.147697	-	0.943963
	[0.5276]	[0.3097]	[0.7007]		[0.3313]
d(GOV_SIZE)	0.000255	3.211755*	0.919258	0.234219	-
	[0.9873]	[0.0731]	[0.3377]	[0.6284]	

NB: (1) ***, **, * are respectively 1%, 5% and 10% level of significance. (2) The value in […] are the probability of Chi square

Table 7. VECM Model Granger Causality – Hypothesis testing

Hypothesis	**Statistic**	**Prob.**
Economic growth does not Granger-cause Financial development	9.305186***	0.0023
Financial development does not Granger-cause Economic growth	1.587451	0.2077

6. Conclusion and Policy Implications

The primary concern of this study is to define the virtues of financial development as leading growth. The study aims as well to make a contribution to the development of African countries by providing a new evidence from Côte d'Ivoire. Specifically, it analyzes the causal relationship between financial development and economic growth in the country.

The literature related to the finance-growth nexus reviewed in the study conclude that the relationship between finance and economic growth remains ambiguous. Although the direction of causality may be one-way or two-way, it may be non-causality.

We used a multi-steps methodology, namely the Autoregressive Distributed Lag (ARDL) approach and the Vector Error Correction Model (VECM) approach to test this relationship in Côte d'Ivoire from 1980 to 2014. The results indicate that there is unidirectional causal relationship between GDP per capita and financial development index in Côte d'Ivoire running from economic growth to financial development. This relationship is in, both, long run and short run.

The policy implications could figure out from the findings of this study is that Côte d'Ivoire have to promote and focus more on economic growth in order to have a high level of its financial development.

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Appendix A

Dependent Variable: D(FD)

Method: Least Squares (Gauss-Newton / Marquardt steps)

Date: 11/02/17 Time: 20:33

Sample (adjusted): 1982 2014

Included observations: 33 after adjustments

D(FD) = C(1)*(FD(-1) - 0.0102187152069*GDPPC(-1) - 0.0054136246602

5*INFL(-1) - 0.00296098231679*TRADE(-1) - 0.0225547745344

*GOV_SIZE(-1) + 0.409053402891) + C(2)*D(FD(-1)) + C(3)

*D(GDPPC(-1)) + C(4)*D(INFL(-1)) + C(5)*D(TRADE(-1)) + C(6)

*D(GOV_SIZE(-1)) + C(7)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.166338	0.032494	-5.119090	0.0000
C(2)	-0.469635	0.151272	-3.104570	0.0046
C(3)	-0.000890	0.000292	-3.050440	0.0052
C(4)	-0.000413	0.000187	-2.212525	0.0359
C(5)	-0.000192	0.000189	-1.015874	0.3191
C(6)	-0.001360	0.000759	-1.792137	0.0848

C(7)	0.000401	0.000940	0.427044	0.6729
R-squared	0.531890	Mean dependent var		0.000135
Adjusted R-squared	0.423865	S.D. dependent var		0.006980
S.E. of regression	0.005298	Akaike info criterion		-7.457160
Sum squared resid	0.000730	Schwarz criterion		-7.139719
Log likelihood	130.0431	Hannan-Quinn criter.		-7.350351
F-statistic	4.923751	Durbin-Watson stat		2.030489
Prob(F-statistic)	0.001744			

Appendix B

Wald Test:			
Equation: Untitled			
Test Statistic	Value	df	Probability
F-statistic	3.044719	(4, 26)	0.0349
Chi-square	12.17887	4	0.0161
Null Hypothesis: C(3)=C(4)=C(5)=C(6)=0			
Null Hypothesis Summary:			
Normalized Restriction (= 0)		Value	Std. Err.
C(3)		-0.000890	0.000292
C(4)		-0.000413	0.000187
C(5)		-0.000192	0.000189
C(6)		-0.001360	0.000759
Restrictions are linear in coefficients.			