

Original Article

# Stocks Market and Economic Growth: A Re-Examination of the Relationship on a Panel of African Countries

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**Abstract** - The objective of this article is to analyze the impact of the development of African stock markets on the economic growth of countries. To achieve this objective, dynamic panel regression models are applied to certain African stock markets over a period from 1990 to 2016. At the end of the analyzes, the results show that the relationship between the financial market and economic growth varies depending on the indicator used, age. The results also suggest that there would be a significant impact on the market size as measured by market capitalization on economic growth. Economic growth is measured by the growth rate of real Gross Domestic Product per capita. The other two indicators of stock market development, namely the turnover rate in volume and the liquidity of the stock market, have no significant impact on real GDP per capita for the new markets. When old markets are taken into account, there is a significant influence of liquidity and the turnover ratio on economic growth. Also, for the young financial markets, there is also a positive influence of growth on the financial market. Cointegration tests show the existence of a long-term relationship between the financial market and growth for all stock markets regardless of their age. These results generally made it possible to join the line of work, which largely validates the hypothesis of a positive influence of the financial markets on economic growth.

**Keywords** - Stock markets, economic growth, panel data, Co-integration.

## I. INTRODUCTION

The financial crisis that hit the world economy in 2008 has brought the debate on the place of financial markets in the development of economic growth up to date (Grillet-aubert and Darpeix, 2018). If overall, African countries have not suffered this crisis with the same amplitude of shock as countries of other continents, the fact remains that the All-out creation of financial centers on the African continent raises questions about the link between financial markets and economic growth in Africa. Indeed, between 1990 and 2016, the African continent saw the birth of several new financial markets. First, the stock markets have enormous potential for decent job creation (to the extent that an operational and efficient stock market

requires good market organization, a viable economic environment for economic operators, a good telecommunications system for facilitating and guaranteeing the flow of market information (Zogning and Ibrahima, 2015)). Second, the stock markets encourage the pursuit of short-term gain and do not allow business managers to develop a long-term strategy. Finally, although it is true that the stock markets cannot attract foreign investors and, therefore, capital flows, these flows are speculative in nature and are often not linked to the fundamentals of the economy. Risk-sharing through integrated stock markets can then reduce the savings rate and slow economic growth Moss et al. (2007). If the theoretical importance of the stock market is no longer to be demonstrated, nevertheless, their impact on the economy remains a subject of debate and more precisely in Africa because of the youth and the narrowness of these. It is the reason why this article is interested in analyzing the impact of stock market development on economic growth. Thus, the main contribution of this article is to enrich the literature on understanding the existing relationship between the development of stock markets and economic growth in Africa.

## II. FINANCIAL MARKETS AND ECONOMIC GROWTH: A STATE OF THE ART

It all started with the work of Bagehot (1873), Schumpeter (1912), Gurley and Shaw (1955), Goldsmith (1969), McKinnon (1973) on the role between the financial system (mobilizing savings) and economic growth. Subsequent studies have been developed by further clarifying the role, the acquisition of information for Grossman and Stiglish (1987); Tirole (1994), a means of control for companies by Verrecchia and Diamond (1982); provision of liquidity for the economy and companies by Levine (1991) and diversification in the choice of investments for Devereux & Smith (1994); Acemoglu & Zilibotti (1997). Indeed, the debate on the link between financial markets and economic growth dates back to the time of Schumpeter (1911). According to the latter, the financial markets are a source of problems for young economies. The debate becomes more arduous with the works of King and Levine in 1993 on "is Schumpeter right?". Indeed, three currents will develop in the



literature. A current in favor of positive influence, another for a negative influence, and a last for an absence of influence

#### **A. The financial market: pillars of economic growth**

Among the supporters of this first trend, we can mention Levine & Zervos (1998); Rousseau & Wachtel (2000); Beck & Levine (2004), who worked in a context of developed countries. Indeed, in order to assess the relationship between financial intermediation and economic growth on the one hand, and the link between capital accumulation and growth in total productivity of the factors of production on the other, Levine & Zervos (1998a) constructed several indicators for the development of the asset markets (the stock market). In a sample of 42 countries over the period 1976–1993, they integrated several of the other factors likely to influence the variables of growth and integrated the development of the banking sector. Rousseau & Wachtel (2000) in France; Beck & Levine (2004) have shown that the development of the stock market is strongly correlated with the real growth rate of GDP per capita. Levine & Zervos (1998) explain that developed stock markets not only mobilize savings, do not just diversify the risk between market agents, but they are also capable of offering several types of financial services comparatively to banks. Thus, they can stimulate economic growth. In a study carried out on 21 emerging countries, among which four countries belonging to North Africa and three countries of sub-Saharan Africa, Mohtadi & Agarwal (2002) showed that there is a positive relationship between the market capitalization, the ratio of rotation (turnover) and economic growth. Subsequently, studies by Osei (2005); Zivengwa & al. (2011) reached the conclusions of a positive influence of the financial markets by using time series. Nowbutsing (2009) uses an error correction model and demonstrates that market liquidity is positively correlated with economic growth. Kolapo & Adaramola (2012) have examined the impact of the Nigerian financial market on its economic growth over the period 1990-2016. Applying Johansen's cointegration tests, the authors conclude that the Nigerian financial market and economic growth are co-integrated. This indicates that a long-term relationship exists between the financial market and economic growth in Nigeria. Quaidoo (2011) examined the relationship between equity market capitalization and economic growth and found that economic growth is the most important factor behind the development of the stock market in Ghana. In a sample of WAEMU countries, Aboudou (2016) finds that there is a positive long-term correlation between the stock market and economic growth.

#### **B. The growth of financial markets: an obstacle to economic growth**

The second approach of this study is in line with the results of Schumpeter (1912), who show that the high liquidity of the markets leads to high price volatility, which causes disastrous shocks for the national and international economy. It is followed by Shleifer & Vishny (1986), who show that the development of stock markets

would encourage a more diffuse ownership structure. However, a more diffuse ownership structure would hinder the more active supervision of managers and hence of corporate governance and, consequently, economical performance. A sharp increase in uncertainty in a financial market, caused in particular by the failure of a major financial or banking institution, leads to a recession or a stock market crash (Mishkin, 2010). Gregorio & Guidotti (1995) shows that increased liquidity reduces uncertainty, and the savings rate because less uncertainty reduces precautionary savings. They conclude that there is a negative and significant relationship between financial development and economic growth. Rajan (2005) believes that financial markets can become victims of their own success. These generate more requests than they appear reliable in the long term.

#### **C. Financial markets and economic growth: two independent economic objectives**

This latter approach militates in favor of neutrality between the financial markets and economic growth. Indeed, Lucas (1988) and Mayer (1988) argue that a developed stock market is not important for financing the business. Similarly, Stiglitz (1993) asserts that the liquidity of the financial markets has no impact on the behavior of company managers and, therefore, does not exercise some corporate control. Naceur & Ghazouani (2006) further reinforce the idea that there is no significant relationship between stock market indicators and the rate of economic growth. They attribute this result to the low level of financial development in MENA countries, which penalizes economic growth. Enisan & Olufisayo (2009) concludes that the positive effects of financial markets on economic growth are canceled out during moments of crisis, thereby reducing the long-term effect of financial markets on economic growth to “nothing”. To shed more light, authors such as King & Levine (1992, 1993) Levine (1998), Demetriades & Hussein (1996), and Arestis & Demetriades (1997) have highlighted the econometrics of panel data. And causality tests in the relationship between the financial market and economic growth. The appearance of causality tests and cointegration tests have led some authors to conduct studies aimed at validating the following demand or supply-lending hypotheses. Most of the time, estimates have been made on data from several countries, so often divergent results have emerged. In addition, for the same country, the nature of the causality between finance and growth may be different depending on the variables used.

### **III. STUDY METHODOLOGY**

The main objective of this study is to analyze the impact of the development of stock markets on the economic growth of African countries. To achieve this objective, data on a sample of 17 countries were collected in the World Development Indicator (WDI) database (2015) over a period from 1990 to 2014. It covers a period from 1990 to 2014 for the first panel and from 2006 - 2014 for the second panel. As an analysis technique, we have retained: descriptive analysis, which will allow us to

understand the characteristics of the variables, and explanatory analysis, which will, in turn, allow us to analyze the impact of stock markets on the economic growth of African countries. To carry out this study, this model was inspired by that of Levine (1991) and Biekpe&Adjasi (2006).

$$Y_{it} = a_0 + a_1MKT_{it} + a_2LIQ_{it} + a_3RTO_{it} + a_4TI_{it} + a_5SAV_{it} + a_6FDI_{it} + \mu_{it} \quad (3.1)$$

With:

**Yit**: Real GDP growth rate per capita of the country I at date t. In accordance with the empirical work of Levine (1997), the growth rate of real GDP per capita is used as the endogenous variable (Yit in CFA francs, constant 1980).

**TI (interest rate)**: The real interest rate is given by the difference between the nominal interest rate and the inflation rate.

**FDI** (foreign direct investment): this is the totality of external flows like technology transfer, brain transfer. It is a form of an interest-free loan.

**SAV** (savings): Domestic savings; represents the percentage of domestic savings in relation to GDP.

**LIQ** (market liquidity): This is the ratio of the total value of transactions divided by the GDP. This measure can have a positive effect on GDP, depending on the regularity of transactions.

**RTO** (turnover ratio): this is the volume turnover rate of the securities traded. It is equal to the ratio of volume transactions to market capitalization in volume.

**MKT** (market capitalization): To measure the size of the stock market (SIZE), we use the measurement used by Levine and Zervos (1996). This is the ratio of market capitalization divided by Gross Domestic Product (GDP). The market capitalization is equal to the total value of all the securities listed on the market at a given time.

In order to analyze the possible cointegration link between the stock market and economic growth, we use a second-generation test: the Westerlund test (2007). It takes into account any inter-individual dependencies. Westerlund (2007) test is based on an error correction model which can be written as follows:

$$Y_{it} = \alpha_i' d_t + \nu_i Y_{i,t-1} + \gamma_i' X_{i,t-t} + \sum_{r=1}^{pi} \lambda_{i,r} \Delta Y_{i,t-r} + \sum_{r=-qi}^{pi} \delta_{i,r} \Delta X_{i,t-r} + \varepsilon_{i,t} \quad (3.2)$$

With:

- **dt**: the deterministic components of the model (constants and/or trend);
- $\Delta$ : The first difference operator;
- **pi** and **qi** respectively, the numbers of delays and advances;
- **Xi**: the column vector of stock market variables explaining the long-term equation;
- $\varepsilon$ : the standard error term;
- **Vi**: the speed of adjustment towards the long-term relationship;
- **i** and **t** respectively the country and the time

If  $\nu_i$  is significantly less than 0, the MCE is valid, i.e., there is a cointegration relationship. The null hypothesis is that of no cointegration relationship

( $H_0: \nu_i = 0$ ) against the alternative hypothesis of homogeneity of the cointegration vectors ( $H_a^p: \nu_i = \nu < 0$ ) or of heterogeneity of the cointegration vectors ( $H_a^p: \nu_i < 0$ ).

Westerlund offers four statistical tests, two of which,  $G_t$  and  $G_a$ , assume a heterogeneity of the cointegration vectors, and two others,  $P_t$  and  $P_a$ , postulate a homogeneity of the cointegration vectors. The test statistic is calculated from the standard deviation of the estimated coefficient  $\nu_i$ , while the test statistic  $G_a$  is calculated from the variance estimators of Newey and West (1994). The  $P_t$  test is a function of the common error correction parameter

( $\nu_i$ ) and its standard deviation, while the  $P_a$  test is a function of  $\nu_i$  and the dimension of the time series.

The econometric method that we use is that of generalized moments, also called General Method Moments (GMM) in the Blundell and Bond system (1991). This method provides solutions to the problems of simultaneity bias, omitted variables, and reverse causation. It deals specifically with the problem of endogeneity of variables that generally arises when we study the relationship between financial development and economic development.

In addition, the increase in the number of observations resulting from panel data makes it possible to guarantee better accuracy of the estimators and to reduce the risk of multi-collinearity. Before making the estimates, analyze the statistical characteristics of the variables through correlations and unit root tests.

#### IV. THE RESULT OF THE STUDY

Table 1 below presents the descriptive statistics for the different variables. The results obtained are presented in terms of average, standard deviation, minimum and maximum values for the observations, i.e., 288 and 40 annual data (time dimension) for 12 and 05 countries, which constitute our sample (individual dimension).

**Table 1. Descriptive Statistics**

Variable	Mean	Std. Dev.	Min	Max
PANEL 1				
MKT	45,84112	60,5735	1,151589	510,3765
LIQ	8,623493	19,343	0,001148	117,567
RTO	10,01431	11,91509	0,0137492	85,08403
Y	2233,295	1973,217	153,0757	10016,65
TAUX I	28,05299	102,672	-43,57266	605,4396
FDI	1,18e+09	2,06e+09	-4,83e+08	1,16e+10
SAV	19,52374	9,07521	-5,106803	48,14323
PANEL 2				
MKT	8,972795	0,9470076	7,089566	10,85602
LIQ	0,2741421	0,0320289	0,2104491	0,337835
RTO	2,279113	0,296051	1,690383	2,867843
Y	1118,737	160,1806	800,2001	1437,273
TAUX I	10,3759	0,783963	8,816905	11,9349
FDI	1,13e+09	1,89e+08	7,49e+08	1,50e+09
SAV	16,67191	0,7345707	15,21114	18,13269

**Table 2. Correlation Between Stocks Markets Variables**

PANEL 1				
	Y	MKT	LIQ	RTO
Y	1,0000			
MKT	0,3569*** (0,0000)	1,0000		
LIQ	0,3252*** (0,0000)	0,7460*** (0,0000)	1,0000	
RTO	0,1346** (0,0197)	0,3510*** (0,0000)	0,5854*** (0,0000)	1,0000
PANEL 2				
	Y	MKT	LIQ	RTO
PIB	1,0000			
	0,0952 (0,3863)	1,0000		
LIQ	0,0083 (0,9400)	0,5908*** (0,0000)	1,0000	
RTO	0,0007 (0,9950)	0,2161** (0,0470)	0,5737*** (0,0000)	1,0000

The observation that emerges from these tests is that the average GDP over the period 1990-2014 is \$ 2008,563. The average minimum value of GDP is \$ 153.0757 recorded in Nigeria in 1993, while the maximum in Mauritius is \$ 10,016.66. Regarding stock market development indicators, the average is 32.90 billion for capitalization, (4.48) billion in liquidity, and (9.03) in turnover ratio. Taking into account the age dimension, we realize that the averages of market capitalization, liquidity, and the turnover ratio are respectively (8.97), (0.27), and (2.27) for the recent markets and (45.84), (8.62), and (10.01) for the old financial centers. The high value of the standard deviation shows the great disparity that exists between the individuals in our different panels, thus suggesting the existence of fixed effects, the existence of possible specificities for each country. However, these results will need to be confirmed by further testing on panel data.

These results may lead us to conclude a priori that time gives importance to stock exchanges in the economic landscape. A priori, we could therefore conclude that the size of a market is a function of its lifespan and determines its influence or not on economic growth. Correlation analysis lets us know if there is a link between the stock market and economic growth, and get an idea of the dependencies of this bond. Thus, looking at Table 2, there is a positive correlation between stock market variables and economic growth (1% for MKT and LIQ and 5% for RTO) for stock markets at least 25 years old in Africa. The age of the stock market allows it to have a size and a volume of trade that allows it to make itself important in the growth process. On the other hand, when we take the younger scholarships, we can observe that there is a lack of correlation. The youth of the stock market naturally gives it a small size and a low level of exchange. We could,

therefore, conclude a priori that the link between the stock market and economic growth is linked to the age of the stock market.

**A. Panel root unit tests**

We use two generations of unit root panel tests: first and second-generation tests. This choice is justified by the

fact that African countries are neither immune from heterogeneity linked to their different economic structures (first-generation test), nor from an interindividual dependence linked to the sharing and management of markets. Common for certain countries or for common financial policies (second-generation test).

**Table 3. Stationariestests: The First And Second-Generation Tests of The Global Sample**

Variables	First-generation test		Second generation test	Conclusions
	Levin et al (2002)	Maddala et wu (1999)	Pesaran (2007)	
MKT	2,69 (0,09)	8,90 (0,09)	-2,19 (0,07)	I(1)
LIQ	-1,60 (0,06)	30,12 (0,08)	-1,91 (0,01)	I(1)
RTO	-1,39 (0,08)	44,19 (0,01)	-1,99 (0,01)	I(1)
TAXI	-0,21 (0,042)	33,55 (0,09)	-2,14 (0,09)	I(1)
FDI	-0,24 (0,041)	25,79 (0,09)	-1,55 (0,078)	I(1)
SAV	-0,22 (0,041)	30,26 (0,036)	-1,87 (0,036)	I(1)
Y	2,64 (0,09)	3,13 (0,00)	2,02 (0,019)	I(1)

The results of the unit root tests presented in Table 3 show that, for the variable RTO, the unit root hypothesis is accepted by the test of Levin, Lin, and Chu (2002) while it is rejected by the Maddala test. And Wu (1999) at the 5% level. Pesaran's second-generation test (2007) for  $p = 3$  delays indicates the presence of a unit root in the dynamics of the variables. The results of the tests on the primary difference variables show that they are stationary. We, therefore, conclude that the variables are integrated into order 1. We can, therefore, easily test if they are linked by a long-term relationship.

When we carry out stationarity tests on different groups of countries according to age (old grants, young grants), we see that the LIQ variable is stationary in level only for the sample made up of countries with the oldest grants, whereas one cannot reject the null hypothesis of the existence of unit root for this variable at the level of the two other groups of countries. Regarding the variable TAUXI, despite the sometimes contradictory results between the

IPS and WM tests, we can conclude that this variable is I (1) only at the level of low-income countries. As for the FDI and SAVING variables, they are non-stationary in level and stationary in the primary difference in all cases. With regard to the inflation rate, the stationarity observed at the level of the overall sample is retained for the different subgroups of countries; therefore, the rate of inflation cannot be taken into account in the study of the cointegration relationship. The second-generation unit root test (CIPS de Pesaran, 2003) provides results very close to those obtained in first-generation tests. However, there is a slight divergence at the level of the two generations of tests with regard to the LIQ variable (global sample), the theLIQ, and TAUXI variables (sample of countries with recent stock exchanges), and the TAUXI variable (sample of old countries scholarships). Since the cointegration relationship cannot be studied when the variables are not integrated in the same order, estimates are only made for the LIQ and TAUXI variables in the case of recent grants and the MKT, FD variables, see Table 4 below.

**Table 4. Stationary Tests: The First And Second-Generation Tests of New Stocks Markets**

Variables	Tests first generation		Second generation test	Conclusions
	Livin et al (2002)	Maddala et wu (1999)	Pesaran (2007)	
Mkt	1,374 (0,00)	6,262 (0,00)	-3,707 (0,01)	I(1)
Liq	-2,208 (0,87)	- 3,030 (0,90)	-3,968 (0,99)	

Rto	-2,906 (0,00)	4,399 (1)	-3,816 (0,00)	I(1)
Tauxi	4,550 (0,01)	2,093 (0,00)	-3,052 (0,07)	I(1)
Fdi	2,264 (0,09)	1,304 (0,08)	-3,575 (0,08)	I(1)
Saving	2,347 (0,02)	- 1,039 (0,02)	-3,632 (0,01)	I(1)
Y	- 1,041 (0,00)	-28,96 (0,00)	-3,805 (0,00)	I(1)

Table 5. Stationary Tests: The First And Second-Generation Test of Old Stocks Markets

Variables	Tests of the first generation		Second generation test	Conclusions
	Livin et al (2002)	Maddala et wu (1999)	Pesaran (2007)	
Mkt	8,444 (0,00)	10,272 (0,00)	-1,707 (0,01)	I(1)
Liq	-3,188 (0,00)	- 5,130 (0,00)	-1,968 (0,01)	I(1)
Rto	-3,985 (0,00)	4,379 (0,00)	-1,816 (0,01)	I(1)
Tauxi	5,580 (0,00)	2,083 (0,00)	-2,052 (0,01)	I(1)
Fdi	3,374 (0,00)	2,374 (0,00)	-1,575 (0,01)	I(1)
Saving	2,587 (0,02)	- 2,139 (0,02)	-1,632 (0,01)	I(1)
Y	- 2,701 (0,00)	-27,96 (0,00)	-1,805 (0,01)	I(1)

### B. Results of Impact analyses

In this section, we analyze the impact of financial development on economic growth using the GMM one-step system. We use the control variables used above. In general, the Sargan / Hansen tests and the AR2 tests confirm the validity of the instruments. The results of the Wald test show that the models formulated are globally significant. Table 4 presents the results obtained from the estimation using the GMM system.

#### a) Market capitalization

Table 6 shows that market capitalization has a positive and significant influence on growth at different thresholds, depending on whether you are in an old market or a new market. You can see that only market capitalization has a significant effect on growth. Indeed, a 1% increase in the level of market capitalization for a young person would be likely to increase GDP by 0.04%, and a 1% increase in the old markets would lead to an increase of 0.09%, which is not negligible. This result can be explained by the fact that capitalization measures the capacity to mobilize capital in a stock market. Indeed, these results confirm the fact that an IPO is likely to stimulate economic growth as well as an increase in capital. Taking into account the legal origin, the results show a non-significance of the effect of market

capitalization on GDP. These results may find their meaning in the nature of the data that was used.

#### b) Liquidity

Taking into account the general liquidity, we realize that the relationship is not significant. These results can be explained by the low level of general liquidity. Indeed the volume of transactions in African financial markets is very low compared to GDP. Also, ignorance of the activities and benefits of the financial markets may explain these results. Taking into account the legal origin, we find that liquidity positively influences economic growth. The quality of the justice system, therefore, does not influence the relationship between the stock market and economic growth.

For the turnover ratio, the results demonstrate a negative and significant influence of the financial markets on economic growth for the old markets and not significant for the young markets. This can demonstrate that older markets are more efficient than younger markets and can, therefore, act better on growth. The experience of a market materialized by age gives us to understanding that it is a variable that influences the relationship. By taking into account the legal origin, we obtain the same results: insignificance, leading us to conclude that the legal origin has no influence on the relationship between financial markets and growth.

**Table 6. GMM System Estimations For Modèle 1**

Y	Coef.	Std. Err.	T	P>t
Y L1.	0,9067335	0,0243234	37,28	0,000
Mkt	0,098842*	0,03574	2,77	0,006
Rto	-0,1009483*	0,0337832	-2,99	0,003
Liq	0,0521281	0,033397	1,56	0,120
Tauxi	-0,0008443	0,0002344	-3,60	0,000*
Fdi	3,59e-11	9,60e-12	3,74	0,000*
Saving	-0,0022345	0,0033308	-0,67	0,503
_cons	0,571443	0,2357027	2,42	0,016
Sargan				0,146
Hansen				1,000
AR(1)				0,000
AR(2)				0,842
Wald				0,000
Instruments				47
GMM panel 2				
Y	Coef.	Std. Err.	Z	P>z
Y L1.	0,9502767	0,0773249	12,29	0,000
Mkt	0,0456323**	0,0187746	2,43	0,015
Rto	0,0096344	0,0160101	0,60	0,547
Liq	-0,0170269	0,0206014	-0,83	0,409
Tauxi	0,0002124	0,0082193	0,03	0,979
Fdi	-1,39e-11	3,42e-11	-0,41	0,684
Saving	0,0184076*	0,0042912	4,29	0,000
_cons	-0,0654565	0,4512822	-0,15	0,885
Hansen				1,000
Sargan				0,22
AR(1)				0,046
AR(2)				0,644
Wald				0,000
Instruments				31

**c) The influence of growth on market capitalization**

If we consider African countries regardless of their age or the legal origin of the judicial system, we can see the positive influence of growth on market capitalization Table 7.

**Table 7. Estimates of The Impact of Growth On Market Capitalization By GMMs Using The 2 Panels 1 Model System**

Lake	Coef.	Std. Err.	Z	P>z	[95% Conf.	Interval]
Mkt						
L1.	0,0370914	0,0202225	1,83	0,067	-0,02544	0,0767267
Y	0,3232419	0,1456011	2,22	0,026**	0,037869	0,6086149
Tauxi	0,015172	0,0143522	1,06	0,290	-0,0129577	0,0433017
Fdi	1,74e-10	7,73e-11	2,25	0,024**	2,27e-11	3,26e-10
Saving	0,0117196	0,0215258	0,54	0,586	-0,0304702	0,0539095

_cons	-1,228358	1,074345	-1,14	0,253	-3,334036	0,8773196
Hansen						1,0000
argan						0,001
AR(1)						0,12
AR(2)						0,14
wald						0
Nombre instruments						31

By taking into account the specificities of each panel, we observe an absence of influence of economic growth on the market capitalization on the old financial markets (table 8), we observe a non-significant relationship between growth and market capitalization (table 8 and 9).

**Table 8. Estimates of The Impact of Growth On Market Capitalization By Gmms In The Model 2 System On Panel**

Lmkt	Coef.	Std. Err.	Z	P>z	[95% Conf.	Interval]
L1.	0,5797663	0,0645503	8,98	0,000	0,4532502	0,7062825
Y	0,086376	0,1296811	0,07	0,947	-0,2455326	0,2628079
Tauxi	0,0008609	0,0004436	1,94	0,052***	-8,51e-06	0,0017302
Fdi	4,11e-11	3,69e-11	1,11	0,265	-3,12e-11	1,13e-10
Saving	0,026835	0,0104347	2,57	0,010**	0,0063834	0,0472866
_cons	0,7408691	1,048261	0,71	0,480	-1,313684	2,795422
Hansen						1,000
sargan						0000
AR(1)						0,003
AR(2)						0,071
wald						0000
Instruments						47

To conclude this part, we can affirm with Biepkke and adjust (2002) that economic growth has an influence on market capitalization. This influence will depend on the age of the financial market.

**d) The Turnover Ratio influence the growth**

The efficiency of a market measured by the turnover ratio is negatively influenced by economic growth for the old financial markets. Legal origin, therefore, has no influence on the relationship between economic growth and the financial markets

**Table 9. Estimates of The Impact Turnover Ratio On The Growth By Gmms In The Model 2 System On Panel 1**

	Robust					
Rto	Coef.	Std. Err.	Z	P>z	[95% Conf.	Interval]
Rto						
L1.	0,5456914	0,0957777	5,70	0,000	0,3579706	0,7334123
Y	-5,615996	2,746549	-2,04	0,041**	-10,99913	-0,2328588
Tauxi	-0,0298174	0,0304756	-0,98	0,328	-0,0895486	0,0299137
Fdi	3,25e-09	1,09e-09	2,97	0,003*	1,11e-09	5,40e-09
Saving	-0,2428222	0,4845215	-0,50	0,616	-1,192467	0,7068225
_cons	47,62572	26,71883	1,78	0,075	-4,742223	99,99367
Hansen						1,000
sargan						0000



AR(1)						0,032
AR(2)						0,985
wald						0000
Nombre instruments						47

**Table 10. Estimates of The Impact of Turnover Ratio On The Economic Growth By GMM's In Model 2 On Panel 2**

Leto	Coef.	Std. Err.	Z	P>z	[95% Conf.	Interval]
Lrto						
L1.	0,5548997	0,1371265	4,05	0,000	0,2861366	0,8236627
Y	0,14288	0,1304097	1,10	0,273	-0,1127184	0,3984784
Tauxi	0,0192049	0,0062568	3,07	0,002*	0,0069417	0,0314681
Fdi	1,29e-10	6,41e-11	2,01	0,044**	3,41e-12	2,55e-10
Saving	0,0174406	0,01591	1,10	0,273	-0,0137425	0,0486237
_cons	-0,7737645	0,6094731	-1,27	0,204	-1,96831	0,4207807
Hansen						1,0000
argan						0,053
AR(1)						0,152
AR(2)						0,186
wald						0
Nombre instruments						31

**Table 11. Estimates Of The Impact Of Growth On The Turnover Ratio By Gmms In The Model 2 System On Panel 2**

Lrto	Coef.	Std. Err.	Z	P>z	[95% Conf.	Interval]
Lrto						
L1.	0,5548997	0,1371265	4,05	0,000	0,2861366	0,8236627
Y	0,14288	0,1304097	1,10	0,273	-0,1127184	0,3984784
Tauxi	0,0192049	0,0062568	3,07	0,002*	0,0069417	0,0314681
Fdi	1,29e-10	6,41e-11	2,01	0,044**	3,41e-12	2,55e-10
Saving	0,0174406	0,01591	1,10	0,273	-0,0137425	0,0486237
_cons	-0,7737645	0,6094731	-1,27	0,204	-1,96831	0,4207807
Hansen						1,0000
argan						0,053
AR(1)						0,152
AR(2)						0,186
wald						0
Nombre instruments						31

**e) The influence of growth on stock market liquidity**

Market activity is not influenced by economic growth in Africa only for young financial markets. This suggests that for young markets, governments must put in place policies to increase market activity, which will later allow markets to play their full role in the economy. Also, in this case, we observe that the relationship between financial markets and economic growth is not influenced by the legal origin of the judicial system (Tables 11, 12).

**Table 12. Estimates of The Impact of Growth On Market Liquidity By Gmms In Model 2 System On Panel 1**

Liq	Coef.	Std. Err.	Z	P>z	[95% Conf.	Interval]
L1.	0,8830936	0,0502544	17,57	0,000	0,7845969	0,9815904
Y	3,043294	3,408593	0,89	0,372	-3,637425	9,724013
Tauxi	0,0230984	0,0264483	0,87	0,382	-0,0287394	0,0749361
Fdi	4,61e-10	5,10e-10	0,90	0,366	-5,38e-10	1,46e-09
Saving	0,1025013	0,3158218	0,32	0,746	-0,516498	0,7215007
_cons	-24,30167	28,12279	-0,86	0,388	-79,42131	30,81798
Hansen						1,0000
sargan						0000
AR(1)						0,124
AR(2)						0,115
wald						0000
Instruments						47

**Table 13. Estimates of The Impact of Growth On Market Liquidity By Gmms In Model 2 System On Panel 2**

Lliq	Coef.	Std. Err.	Z	P>z	[95% Conf.	Interval]
Lliq						
L1.	0,1105763	0,142437	0,78	0,438	-0,1685952	0,3897477
Y	0,2907454	0,1337055	217	0,030**	0,0286875	0,5528032
Tauxi	-0,01714	0,0193238	-0,89	0,375	-0,0550139	0,020734
Fdi	2,75e-10	1,88e-10	146	0,143	-9,34e-11	6,44e-10
Saving	-0,030681	0,0104225	-2,94	0,003*	-0,0511086	-0,0102534
Cons	-3,101253	1,128551	-2,75	0,006	-5,313173	-0,8893327
Hansen						1,0000
argan						0,204
AR(1)						0,034
AR(2)						0,616
wald						0,006
Instruments						31

The econometric estimates present fairly similar results when we take into account the initial value at the beginning of the year of the variables in the time dimension (dynamic panel) and when we trust them (static panel). These results allow us to evaluate our first two research questions, as well as our first two hypotheses.

The results suggest an influence of size on the financial markets. Results join those obtained by Biekpe and Adjasi (2002) on a sample of African countries. Therefore, a large market is likely to have a positive influence on growth. The African financial market authorities, therefore, have an interest in promoting conditions of access to listing to see IPOs multiply as well as capital increases via the financial markets. The work of Mothadi and Agarwal (2002), who also used market capitalization as an indicator

of the size of the financial market, confirms these results. However, taking into account the age and legal origin of the legal system, we come to the conclusion that this has no influence on the relationship by taking into account just the size of the market. The older the financial market, the more efficient it is, and the more it is inclined to play its role in the process of economic growth. These results are also confirmed by those of Mothadi and Agarwal (2002) and Zoning (2015), who in 5 countries concluded that large old markets could influence economic growth. These results are nuanced to the extent that, by introducing market efficiency (turnover ratio), the influence becomes negative. These results are different from those obtained by Levine and Zervos (1996) but coincide with those of Gregorio and Guidotti (1995) and Rajan (2005). Indeed, an efficient and large market is likely not only to create

speculative bubbles (victim of its success) but also for very inactive markets like those of the continent to benefit only investors and not the whole economy.

Regarding liquidity, there is a lack of influence of the financial markets on economic growth. As the African markets are fairly concentrated on the primary market, the old market, which represents a large part of financial activities, is very little developed. Some of these markets still end up with fixed quotes. This weak activity on most of the markets on the African continent would be at the origin of these results. These results do not corroborate with those of King and Levine (1992) and Bencivenga, Smith, and Starr (1996), who highlighted the role of stock market activity in the economy. Taking into account the legal origin of the legal system, the results are the same and are therefore different from those obtained by Beck et al. (2003) and Djankov al (2007, 2008). They can be explained by the strong state presence in the legal system on the African continent (the quality of political institutions).

We can therefore validate hypothesis one that the financial markets have an influence on growth in Africa in general. But taking into account the indicators, we can answer on the basis of our results that the size (measured by the market capitalization) and the efficiency (measured by the turnover ratio) of the market influences economic growth, the size positively and efficiency negatively. In regards to assumption two, age and legal origin influenced the relationship between the stock market and economic growth, and the assumption is partially valid. Indeed, taking efficiency into account, we see an influence on the old markets and not for the young. So for our study, age is a factor that can influence the relationship between the stock market and economic growth.

**C. Cointegration test results**

As the homogeneity of the panel is unlikely, we take into account tests based on the inter-individual dimension, which leads us to conclude that there is cointegration between the stock market and economic growth. This conclusion is validated by Westerlund tests (lines Gt and Ga, associated with a heterogeneity of the cointegration vectors).

**Table 14. The Co-Intégration Test Result of Westerlund2007 On 04 Panels**

Tests	Statistiques	z-statistiques	p-value
<b>Old market</b>			
Gt	-4,161	-4,955	0,040
Ga	-2,581	5,924	0,000
Pt	-7,483	1,620	0,720
Pa	-5,083	3,453	0600
<b>Newmarket</b>			
Gt	- 4,161	-4,956	0,09
Ga	- 2,923	5,0158	0,07
Pt	-7,883	1,930	0,810
Pa	-5,188	3,570	0,620

The results that we obtain by doing cointegration tests join those of Christopoulos and Tsionas (2004), which shows a mutual influence of the stock market on growth. Indeed, by omitting the individual specificities (Pédroni test) and by integrating them (Westerlund), the results obtained are just as equivalent. Financial markets are integrated with economic growth. In the African context, financial markets interact with economic growth. The DOLS and PMG approaches make it possible to highlight not only causation but also the long and short-term relationship between financial markets and growth.

The PMG approach presents as more to take into account the specific characteristics of each country, also of the evolution of the series (dynamic panel) and the non-stationarity of the variables. The overall results show a long-term relationship between the financial markets and economic growth. This means that the convergence criteria of African financial markets such as low volatility, low liquidity, relatively small sizes, the absence of transfer of market funds for the economy, etc. are corrected gradually in the long term. The functions of the financial market are embedded in the economy over time.

**A. Résultat of estimates using PMG**

**Table 15. Long Run Term Estimation Relation Between Finance And Growth By PMG On New Markets**

Coefficient de long run term	MKT	LIQ	RTO
Variable endogenous: y			
FINANCE	0,585*** (0,047)	0,254 (0,088)	0,260 (0,039)
TAUXI	0,221*** (0,019)	-0163 (0,117)	-0,052 (0,085)

FDI	-0,064 (0,044)	- 0,174 (0,137)	- 0125 (0,084)
SAVING	0,237*** (0,02)	-0,107 (0,12)	-0,06 (0,087)
COEF EC $\phi$	-0,080*** (0,017)	-0,035*** (0,005)	-0,053*** (0,007)

**Table 16. Long Run Term Estimation Relation Between Finance And Growth By PMG On Old Markets**

Coefficient de long terme	MKT	LIQ	RTO
Variable endogène: y			
FINANCE	0,028 (0,191)	0,385 (0,253)	0,306 (0,222)
TAUXI	-2,294*** (0,491)	-2,419*** (0,654)	-2,580 (0,679)
FDI	-0,069 (0,195)	- 0,106 (0,246)	- 0,102 (0,234)
SAVING	-2,027** (0,310)	-2,320 (0,597)	-2,560 (0,642)
COEF EC $\phi$	-0,021*** (0,003)	-0,016*** (0,002)	-0,017*** (0,002)

Overall, these results show a long-term relationship between the financial market and economic growth. These results join those of Levine (1998). Indeed, over time, a financial market will always have a relationship with economic growth. The influence can be positive or negative, as it can be reciprocal. The African markets in their current states and taking into account the collective and individual dynamics of these markets, in the long term, will have a say in the growth process. Thus a young market, not very active, and that of Mauritania, according to our results, can only develop and have an influence on growth. A fairly young market like that of Uganda over time will adjust to the economic and political mechanisms to influence growth positively or negatively. Generally speaking, countries with an insufficiently liquid and less efficient financial market must put in place strategies in order to develop them and benefit from the gains provided by the financial market. From the literature and our results, it appears that the influence of financial markets on economic growth is really in the short term. This influence is positive or negative, depending on the indicator used. But in the long term, the relationship exists regardless of the indicator and the factor (age). It is therefore preferable for African governments to set up policies allowing them to develop this financing instrument, which is the financial market but also to set up framework policies that should make it possible to avoid the negative effects.

**CONCLUSION**

The main objective of this article was to analyze the link between the development of stock markets and economic growth in African countries. To reach this objective, we used panel regression equations. More precisely, we used the GMM dynamic panel method in the system in order to highlight the link between stock markets and growth; As well as cointegration tests in panel data to analyze the long-term relationship. As the explained variable, we used GDP, which is the most commonly used indicator to measure economic growth. As explanatory variables, the

efficiency of the market, market activity, and the size of the stock market to measure the development of the stock market. These results show that the relationship between the financial market and economic growth varies according to the indicator used, the age, the legal origin of the judicial system. The results also suggest that there would be a significant impact on the market size as measured by market capitalization on economic growth. The other two indicators of stock market development, namely the volume turnover rate and stock market liquidity, have no significant impact on real GDP per capita for the new markets. When old markets are taken into account, there is a significant influence of liquidity and the turnover ratio on economic growth.

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