

ASSESSING THE IMPACT OF STOCK MARKETS ON FINANCIAL DEVELOPMENT IN SELECTED SUB- SAHARAN COUNTRIES

Kanfitine Laré-Lantone¹

Université de Lomé, Togo

E-mail: klantone@hotmail.com; klantone@tg.refer.org

ABSTRACT

This paper tests the economic rationalization of six sub Saharan African stock markets. Gaps in the growth trends of stock markets and banks activities in Cote d'Ivoire, Ghana, Kenya, Mauritius, and Nigeria over the period 1982-2008 indicate that contrary to South Africa their stock markets were not economically rationalized. The empirical testing of the impact model indicates that they only exerted marginal impact on the national financial development and that the channels through which they transmitted their impacts varied by country. Factors accounting for their ill performances include the fact that they were established at times when the national economies hadn't reached their threshold points.

Key words: stock market, impact, banking, financial development, threshold, economic rational, performance, efficiency, outreach.

JEL Codes: G14, G15

¹ Kanfitine Laré-Lantone, Ph.D., Assistant Professor, Université de Lomé, BP 3641, Lomé-Togo, E-mail: klantone@hotmail.com; klantone@tg.refer.org

I. INTRODUCTION

Most studies on the choice between market-based and bank-based financing of economic growth conclude that financial structure doesn't matter and that banks and stock markets act in synergy to foster financial development and economic growth [Levine (2004).] However, some favor bank-based systems over market based systems in the financing of growth in developing countries [Tadesse (2002)] leading to arguments against the pursuit of stock markets development in Africa. The main argument is that African countries can achieve similar growth targets at lower cost with better organized banking sectors than stock markets [Singh (2008).] At the same time, evidences exist that the performances of sub-Saharan African stock markets are not poor on all counts [Ndikumana (2001), Yartey (2006)], thus spurring a debate over these stock markets economic rationalization.

It is in the same context that the current paper set to test whether stock markets in Cote d'Ivoire, Ghana, Kenya, Mauritius, Nigeria and South Africa have promoted (i) the expansion of banking activities and thus (ii) financial development over the period 1982-2008. For, it evaluated the impact they exerted on banks activities and on the expansion of national financial systems. Specifically, it compared growth trends in stock markets' capitalization with bank credits and then with total deposits in financial sectors. The large gaps between the growth paces of stock markets' capitalization and those of (i) aggregated bank credits and (ii) aggregated total deposits in financial sectors reflect an absence of co-evolutions in these two financial sub sectors except in South Africa. An empirical testing of the derived impact model also confirmed that globally the selected stock markets only exerted marginal impacts on the countries financial development. Also, the channels through which each stock market transmitted its impact to the national financial system varied from one country to the other. Finally, the fact that none of the variables is significant for South Africa is an indication that its stock market is an outlier in the sample studied.

The rest of the paper is organized in four subsequent sections. Section II reviews the literature. Section III discusses the methodology and data. Section IV presents the empirical results and Section V concludes.

II. LITTERATURE REVIEW

As broadly established in the literature, stock markets enhance financial development which in turn boosts economic growth [Gelbard & Leite (1999).] But, views diverge on the economic rationalization of developing countries' stock markets in general. In the specific case of Africa, part of the literature suggests that countries should abstain from establishing stock markets and will rather gain from developing well functioning banking sectors [Singh (2008).] At the same time, other findings suggest that the performances of sub-Saharan stock markets are not so bad on all counts and individually some have influenced the national economies positively [Ndikumana (2001), Yartey (2006).] Such findings are in line with theoretical suggestions that at the initial stages of development, stock market development is often accompanied with an expansion of the banking sector [Yoshitomi & Shirai (2001); Rajan & Zingales (1998a)]. Some authors have even derived a bidirectional relationship between stock market development and growth [Brasoveanu and al (2008), Hondroyiannis and al (2005).] Stock market development boosts economic growth as it promotes capital accumulation, enhances liquidity, and facilitates investment in longer-run, higher-return projects [Boyd & Smith (1995), Levine & Zervos (1996).] Inversely, the growth process is accompanied with an expansion of equity markets both in term of the number of listed companies and in term of market capitalization [Capasso (2006), Levine & Zervos (1996).] As for the impact on banks, it is rather both banks and stock markets that act in synergy to foster financial development and growth [Levine (2004).] Thus, banks and stock markets are rather complimentary with each playing an important role in the process [Yoshitomi & Shirai (2001).] It remains that such a synergy only arises when the establishment of the stock market happens after the national economy had reached its "threshold point". The threshold hypothesis stipulates the existence of a particular point in time when an economy has fulfilled the necessary conditions for the development of its stock market. For example, He & Pardy (1993) located the threshold point of Asian stock markets around the mid-80s.

III. DATA AND METHODOLOGY

To test the economic rationalization of each selected stock market, we measured the impact it exerted on the country's financial development overtime using two complementary analytical methods. The first method consisted of comparing growth trends in stock markets' capitalization with growth trends in bank credits and those in total deposits in financial sectors to determine whether they moved in synchrony. The second method consisted

of testing empirically the impact each selected stock market exerted on the expansion of the national financial system.

The sample and period studied were determined based on data availability. The data are obtained from various sources. Specifically, stock market, trade and Foreign Direct Investment data are extracted from the World Bank Financial Structure database and the World Bank African Development Indicators while money and credit data are obtained from the IMF International Financial Statistics.

Using the data, we compared growth trends in stock market capitalization to GDP ratios with those in bank credit to the private sector to GDP ratios [see He & Pardy (1993).] Then, we compared growth trends in market capitalization to GDP ratios with those in total deposits in the financial systems to GDP ratios [see Capasso (2006).] The results based on the six countries aggregated data depict positive trends in stock market capitalization to GDP ratios, bank credits to the private sector to GDP ratios, and total deposits in the financial system to GDP ratios. However, the growth pace in stock market capitalization to GDP ratios is substantially higher than those in bank credits to the private sector to GDP ratios and total deposits in the financial system to GDP ratios (Figure 1.) The existence of these gaps is an indication that there were no co-evolutions in stock market activities and bank activities in these countries except in South Africa. But performance indicators for all sub Sahara African stock markets are generally uplifted by the comparatively outstanding performance of the South African Stock market (Table 1.) Cross-country comparisons of the results show that South Africa had the lowest average growth rate in market capitalization to GDP ratios and bank credits to the private sector to GDP ratios but also the narrowest gap between both indicators. While Cote d'Ivoire experienced a negative averaged growth rate in market capitalization to GDP ratios and bank credits to GDP ratios, the other four countries recorded large gaps between them with the extreme case exhibited by Ghana (Figure 2.) As a result, only the South African stock market and banking sector had experienced a co-evolution of their activities over the period 1990-2008.

To test these primary findings, we extended the analysis to econometric estimations using a theoretical impact model which is an adapted version of the theoretical model used to measure the impacts of Microfinance Institutions on financial systems in the West African Economic and Monetary Union [Lare-Lantone (2011)]. It is based on the assumption that the performance of a financial system depends on the performance of its stock market and the influence of economic factors.

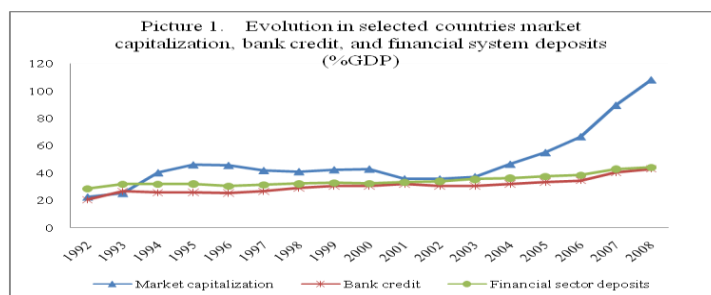


Table 1. Performance of world regions developing countries' stock markets¹ (1995-2009)

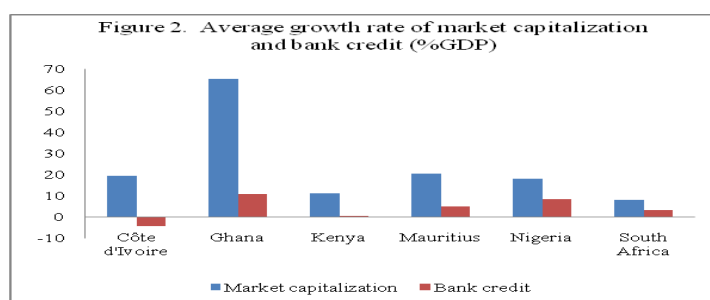
	Capitalization of LC (%GDP)		Stocks traded (%GDP)		Turnover ratio (%GDP)	
	1990-99	2000-09	1990-99	2000-09	1990-99	2000-09
	East Asia & Pacific ²	36.9	63.7	27.0	67.0	136.1
Europe & Central Asia ²	11.0	39.7	9.2	26.9	59.0	79.8
Latin America & Caribbean ²	23.9	40.4	9.0	12.7	38.7	29.9
Middle East & North Africa ²	21.6	24.8	3.4	6.0	16.6	19.8
Sub-Saharan Africa ²	100.5	103.9	17.2	38.8	17.5	33.3

Source: World bank indicator and author's estimation, (1) average value, (2) developing countries only.

Table 2. Performance of the selected sub-Saharan stock markets¹ (1992-2008)

	Number of listed Companies		Market capitalization LC ² (% of GDP)		Stocks traded ³ (% of GDP)		Turnover ratio (%)	
	1992-99	2000-08	1992-99	2000-08	1992-99	2000-08	1992-99	2000-08
	Côte d'Ivoire	32	38	7.7	19.8	0.2	0.4	2.4
Ghana	19	29	15.3	16.4	0.5	0.5	2.7	1.1
Nigeria	57	52	7.9	12.2	0.3	1.5	2.9	4.9
Kenya	35	47	16.9	25.3	0.5	2.1	3.4	3.4
Mauritius	181	205	32.5	47.6	1.9	2.0	5.2	3.0
South Africa	152	203	147.7	203.5	27.1	102.9	17.6	21.0

Source: World bank indicator and author's estimation, (1) average value, (2) Listed Companies, (3) total value.



$$I_t = f_t(M_t, E_t) \quad (2)$$

I_t represents the performance of the financial system, M_t the overall performance of the stock market and E_t the influences economic factors exert directly and independently on the performance of the financial system. Hence,

$$\Delta I_t = \alpha_0 + \alpha_1 \Delta M_t + \alpha_2 \Delta E_t + \alpha_3 \epsilon_t \quad (2)$$

It is also assumed that a change in a stock market performance at time (t) is the cumulated sum of all partial changes that had occurred at each previous time following an exogenous shock generated at time (t-i). The sizes of these partial changes are assumed to vary at an arithmetic rate from one period to the other so that the actual total change occurring at time (t) is:

$$\Delta M_t = (1 - \Phi) \sum_{i=0}^{t-1} \Delta M_{t-i} \quad (3)$$

Φ is the average growth rate of the size of each partial change between (t) and (t-i). Dividing Equation (2) by Equation (3) leads to Equation (4):

$$\frac{\Delta I_t}{\Delta M_t} = \frac{1}{(1 - \Phi)} \left[\alpha_0 + \alpha_1 + \alpha_2 \frac{\Delta E_t}{\Delta M_t} + \alpha_3 \frac{\epsilon_t}{\Delta M_t} \right] \quad (4)$$

At the same time, it is assumed that changes in a stock market overall performance depend on changes in its outreach, financial structure, and financial efficiency and changes in the country's macroeconomic performance and degree of financial openness. Thus:

$$\Delta M_t = \beta_0 + \beta_1 \Delta O_t + \beta_2 \Delta F_t + \beta_3 \Delta P_t + \beta_4 \Delta X_t + \beta_5 \Delta S_t + \beta_6 \epsilon_t \quad (5)$$

$$\Delta E_t = \gamma_0 + \gamma_1 \Delta O_t + \gamma_2 \Delta F_t + \gamma_3 \epsilon_t \quad (6)$$

O_t represents stock markets density, F_t stock markets financial structure, P_t stock markets financial efficiency, X_t macroeconomic performance, and S_t degree of financial openness. Substituting Equations (5) and (6) into (4) leads to:

$$i_t = \frac{1}{(1 - \Phi)} [\alpha_0 + \alpha_1 + \alpha_2 \beta_1 o_{t+} + \alpha_2 \beta_2 f_{t+} + \alpha_2 \beta_3 p_{t+} + \alpha_2 \beta_4 x_{t+} + \alpha_2 \beta_5 s_{t+} + \alpha_3 \epsilon_t] \quad (8)$$

with $i_t = \frac{\Delta I_t}{\Delta M_t}$, $o_{t+} = \frac{\Delta O_t}{\Delta M_{t+}}$, $f_{t+} = \frac{\Delta F_t}{\Delta M_{t+}}$, $p_{t+} = \frac{\Delta P_t}{\Delta M_{t+}}$, $x_{t+} = \frac{\Delta X_t}{\Delta M_{t+}}$, $s_{t+} = \frac{\Delta S_t}{\Delta M_{t+}}$, $\epsilon_t = \frac{\alpha_0 + \alpha_1 + \alpha_2 + \alpha_3}{\Delta M_{t+}}$

Equation (8) is the impact equation. The derived variables and the expected signs of each explanatory variable are summarized in Table 3.

Table 3. Variables retained

Symbol	Definition	Expected sign
i_t	Change in the performance of the financial system	
O_{t-1}	Overtime change in stock market performance	+
f_{t-1}	Overtime change in stock market density	-
p_{t-1}	Overtime change in stock market efficiency	+
x_{t-1}	Overtime change in macroeconomic performance	-
s_{t-1}	Overtime change in financial openness	-

IV EMPIRICAL RESULTS

We measured the dependent variable “change in the performance of the financial system” with FDEV1, FDEV2, FDEV3, and FDEV4. We measured the overtime change in the stock market performance with STRUC1 and STRUC2, the overtime change in the stock market efficiency with OUTRE1 and OUTRE2, the overtime stock market efficiency with EFFIC, the overtime change in macroeconomic performance with MACRO1, MACRO2, and MACRO3, and the overtime change in financial openness with OPEN1 and OPEN2 as specified in Table 4.

We estimated each of the retained variables for the period 1992-2008 and computed the model using the pooled data least square technique to capture cross-country specifics and tested all the series for stationarity using the (i) Levin, Lin & Chu (LLC) and (ii) Im, Pesaran & Shin (IPS) tests including individual effects specifications. Globally, the LLC led to rejection of the null hypothesis of a common unit root in the series for all the series while the IPS led to the rejection of the null hypothesis for the series of EFFIC, OUTRE1, MACRO2 and OPEN2. Subsequently, we computed the model with successively each dependent variable and obtained the most robust results with FDEV1 and FDEV3. The independent variables EFFIC, OUTRE2 and MACRO3 are the most significant variables with all the measures of the

Table 4. Measurement of the retained variables

Name	Estimation
FDEV1	$\Delta(\text{Growth in M2}) / \Delta(\text{Market capitalization})$
FDEV2	$\Delta(\text{Credit to private sector over GDP ratio}) / \Delta(\text{Market capitalization})$
FDEV3	$\Delta(\text{Credit to private sector over Domestic credit ratio}) / \Delta(\text{Market capitalization})$
FDEV4	$\Delta(\text{M2 over GDP}) / \Delta(\text{Market capitalization})$
STRUC1	$\Delta(\text{Total value traded}) / \text{Lagged } \Delta(\text{Market capitalization})$
STRUC2	$\Delta(\text{Domestic credit}/\text{MC}) / \text{Lagged } \Delta(\text{Market capitalization})$
OUTRE1	$\Delta(\text{Number of listed companies per capita}) / \text{Lagged } \Delta(\text{Market capitalization})$
OUTRE2	$\Delta(\text{Number of listed companies}) / \text{Lagged } \Delta(\text{Market capitalization})$
EFFIC	$\Delta(\text{Turnover ratio}) / \text{Lagged } \Delta(\text{Market capitalization})$
MACRO1	$\Delta(\text{per capita GDP}) / \text{Lagged } \Delta(\text{Market capitalization})$
MACRO2	$\Delta(\text{inflation}) / \text{Lagged } \Delta(\text{Market capitalization})$
MACRO3	$\Delta(\text{GDP growth}) / \text{Lagged } \Delta(\text{Market capitalization})$
OPEN1	$\Delta(\text{trade openness}) / \text{Lagged } \Delta(\text{Market capitalization})$
OPEN2	$\Delta(\text{FDI Inflows}) / \text{Lagged } \Delta(\text{Market capitalization})$

dependent variables except FDEV4. Inversely, STRUC1, STRUC2, OUTRE1, MACRO1, and OPEN1 are statistically non significant. MACRO2 is only significant with FDEV1 and FDEV3 while OPEN2 is only significant with FDEV1.

The results obtained from testing the model on individual country data and holding successively each dependent variable's coefficient fixed show that the market performance variable STRUC1 is significant for Ghana and Kenya and STRUC2 for Mauritius and Nigeria. The market efficiency variable EFFIC is only significant for Cote d'Ivoire, Ghana, and Mauritius. Both market density variables OUTRE1 and OUTRE2 are significant for Cote d'Ivoire and Mauritius. The macroeconomic performance variable MACRO1 is significant for Cote d'Ivoire and Mauritius while MACRO2 is only significant for Cote d'Ivoire. Finally, the financial openness variable OPEN2 is only significant for Cote d'Ivoire but OPEN1 is generally non significant.

Further, we computed the actual size of the impact each selected stock markets exerted on the expansion of the country's financial system. Comparatively, the results show that the impact exerted by the stocks markets in Cote d'Ivoire, Ghana, and Mauritius was positive with FDEV2, FDEV3, and FDEV4. Inversely, it is only with FDEV1 that the impact was positive but marginal in Kenya and South Africa. In Nigeria, the impact was positive and very marginal with FDEV1 and FDEV2.

The cumulated impact all the selected stock markets exerted on all six countries financial development was positive and marginal with all measures of the dependent variables. Several factors account for the fact that the selected stock markets only exerted marginal impacts on the countries' financial development. The fact that they didn't emerge naturally at the "threshold points" of the national economies but their establishment relied on outside influences and resulted from ad hoc governmental programmes of privatization and financial liberalization [Honohan and Beck (2007).]

Table 5. Significance of variables by country

	FDEV1	FDEV2	FDEV3	FDEV4
EFFIC	All	All	All	-
	Cote d'Ivoire	Cote d'Ivoire	Cote d'Ivoire	-
	Ghana	-	Mauritius	-
STRUC1	Ghana	Ghana	Ghana	-
	Kenya	Kenya	Kenya	-
STRUC2	Mauritius	Mauritius	Mauritius	Mauritius
	Nigeria	Nigeria	Nigeria	-
OUTRE1	Cote d'Ivoire	Cote d'Ivoire	Cote d'Ivoire	-
	-	Mauritius	-	Mauritius
OUTRE2	All	All	All	-
	Cote d'Ivoire	-	-	-
	-	-	-	Mauritius
MACRO1	Cote d'Ivoire	-	Cote d'Ivoire	Cote d'Ivoire
	-	Mauritius	-	-
MACRO2	All	-	All	-
	Cote d'Ivoire	Cote d'Ivoire	Cote d'Ivoire	Cote d'Ivoire
MACRO3	All	All	All	-
OPEN2	All	-	-	-
	Cote d'Ivoire	Cote d'Ivoire	-	-

Table 6. Size of stock markets impact on financial development (1992-08)

	Indicator	Φ	$1/(1+\Phi)$	Impact
Cote d'Ivoire	FEDV1	1.2E-06	0.99999882	-3.2702
	FDEV2	-2E-07	1.00000019	0.58894
	FDEV3	-8E-08	1.00000008	0.3013
	FDEV4	-6E-08	1.00000006	0.26527
Ghana	FEDV1	-2E-06	0.99999972	-2.2178
	FDEV2	9.9E-07	1.00000017	0.99409
	FDEV3	4.6E-07	1.00000004	0.46299
	FDEV4	6.3E-07	1.00000014	0.63355
Kenya	FEDV1	-5E-09	1	0.09324
	FDEV2	2.3E-08	0.99999998	-0.0524
	FDEV3	-2E-09	1	-0.0085
	FDEV4	3.8E-08	0.99999996	-0.0495
Mauritius	FEDV1	-4E-07	1.00000036	-1.4388
	FDEV2	-1E-08	1.00000001	1.93435
	FDEV3	6.1E-08	0.99999994	0.31202
	FDEV4	-9E-08	1.00000009	2.34562
Nigeria	FEDV1	-2E-08	1.00000002	0.01114
	FDEV2	2.7E-08	0.99999997	0.00333
	FDEV3	1.7E-08	0.99999998	-0.0228
	FDEV4	1.9E-08	0.99999998	-0.0169
South Africa	FEDV1	2.7E-08	0.99999997	0.15626
	FDEV2	-7E-09	1.00000001	-0.0425
	FDEV3	-5E-09	1.00000001	-0.0238
	FDEV4	-6E-09	1.00000001	-0.0313
All	FEDV1	-26.013	-0.0399794	0.16276
	FDEV2	4.2368	0.19095615	0.12662
	FDEV3	4.02868	0.1988594	0.12538
	FDEV4	2.58314	0.27908477	0.11282

Besides, local firms have very limited absorption capacities of bank and market resources as they are mostly small in size, and non viable. Consequently, they rely more on internal financing, a behavior some authors attribute to the fact that they lag in technological innovation. It is advanced in the literature that technological innovation influences the degree to which an

industry uses external finance [Claessens and Laeven (2004).] Finally, the dualistic nature of most sub-Sahara African economies diverts part of the financing of national productions from banks and stock markets towards informal sources.

V. CONCLUSION

This paper attempted to measure the impact stock markets in Cote d'Ivoire, Ghana, Kenya, Mauritius, Nigeria, and South Africa exerted on the national financial development over the period 1992-2008. It found that the growth pace in stock market activities surpassed those in banks activities and financial sector. An empirical testing of the impact model confirmed that the selected stock markets only exerted very marginal impact on the countries financial development. Globally, the results are more robust with the dependent variables measured as 'growth in M2 over GDP' and 'credit to private sector over domestic credit ratio'. Country-based results reveal that the channels through which each stock market influenced the national financial development vary by country and that South Africa is an outlier in the sample as its stock market is an emerging one.

The impact size exerted by all the selected stock markets on all six countries' financial development was positive but marginal. Also, except South Africa none of the selected countries experienced co-evolutions of their stock market and bank activities as suggested in the literature. They endure different types of constraints that may be the consequence of the simple fact that they were established at times when the national economies had not reached their threshold points.

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