



Speculative bubbles and irrational exuberance in African stock markets



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ABSTRACT

We apply the sequential unit root tests of Phillips et al. (2015) for mildly explosive processes to identify and date-stamp bubbles in the emerging and frontier African stock markets. We find periods of explosive behavior in the price–dividend ratio in several markets which is indicative of irrational exuberance. We find strong evidence of multiple speculative bubbles in Botswana, Egypt, Ghana, Kenya, Nigeria and Tunisia. Results of our study are important to individual investors, emerging markets fund managers, and policy makers.

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1. Introduction

Africa is well known for being a source of raw materials and commodities. African markets experienced rapid growth and improvements since countries are going through economic reforms and towards more democracy and less violent wars during the past years. High GDP growth rates (African Development Bank Group, 2016; IMF, 2016) along with positive returns in the stock markets attract more attention of international investors who are aiming for diversification benefits for their portfolios. Several reports point towards the long-term positive prospects (not without risks and uncertainties) from investing in Africa given its current and expected population, with young, better educated middle class consumers.¹ Therefore, this warrants further studies related to the stock markets of these promising frontier and emerging African markets.

Financial bubbles usually burst before financial crises. Investors are worried by the idea that emerging markets could be more prone to price bubbles. Speculative bubbles occur when there is significant deviation and decoupling between fundamental values of assets and the actual market prices. Historically, rallies and collapses of prices happened in several asset classes during different time periods. Such bubbles could occur because of psychological factors resulting from irrational behavior such as herding (Shiller, 2005). It is not unthinkable or unbelievable to have a bubble in African stocks (Taylor, 2016). African stock markets tend to lack liquidity and suffer from thin trading (Jefferis and Smith, 2005). Blavy (2002) argues that fundamental information in emerging markets is limited when there are low requirements for disclosure and therefore scarce corporate information available for investors to approximate intrinsic values. Such environment combined with lack of liquidity, high volatility, uncertainty and missing market makers could increase the probability of a speculative bubble where prices deviate significantly from their fundamentals mainly due to irrational exuberance.

To the best of our knowledge, this paper is the first to utilize the recursive right-tailed unit root tests of Phillips, Shi and Yu (PSY) (2015) to detect bubbles in a number of African frontier

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¹ <http://www.africanbusinesscentral.com/wp-content/uploads/2016/01/The-Africa-Investment-Report-2015-fDi-Intelligence-Report.pdf>.
<https://www.weforum.org/agenda/2016/05/6-reasons-to-invest-in-africa/>.
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Table 1
The SADF and GSADF tests of the price–dividend ratios of African equity markets.

	Critical value	GSADF	Critical value	SADF
Botswana		6.773***		0.102
99% critical value	3.094		2.096	
95% critical value	2.487		1.594	
90% critical value	2.161		1.317	
Egypt		4.302***		3.696***
99% critical value	2.627		1.826	
95% critical value	1.932		1.278	
90% critical value	1.690		0.988	
Ghana		11.372***		11.372***
99% critical value	2.541		1.897	
95% critical value	2.035		1.328	
90% critical value	1.704		1.027	
Kenya		4.145***		4.145***
99% critical value	2.627		2.052	
95% critical value	2.056		1.426	
90% critical value	1.742		1.149	
Mauritius		1.364		−0.423
99% critical value	2.692		2.052	
95% critical value	1.979		1.426	
90% critical value	1.706		1.149	
Morocco		1.729		−0.982
99% critical value	2.735		2.052	
95% critical value	1.979		1.426	
90% critical value	1.733		1.149	
Nigeria		2.589**		−0.209
99% critical value	2.983		2.032	
95% critical value	2.274		1.492	
90% critical value	1.997		1.205	
Tunisia		7.204***		5.128***
99% critical value	2.735		1.901	
95% critical value	1.943		1.406	
90% critical value	1.707		1.022	

Note: We use 1000 replications in a Monte Carlo simulation to obtain the critical values of the generalized sup ADF test (GSADF) and the sup ADF test (SADF) of Phillips et al. (2015). The initial window size is 24 observations.

** Indicate 5% significance.

*** Indicate 1% significance.

stock market. This method allows for nonlinear structure in data with breaks. It is also capable of detecting multiple bubbles. It was previously applied to investigate bubbles in oil prices (Caspi et al., 2015) and real estate (e.g. Joyeux and Milunovich, 2015). We extend the work of Chang et al. (2016) who study bubbles using the same method in the South African market. We find strong evidence of multiple speculative bubbles in Botswana, Egypt, Ghana, Kenya, Nigeria and Tunisia. Results of our study should be of interest to international investors thinking of diversifying into Africa. Also, central bankers and policy makers should always monitor markets and take action to prevent bubbles from bursting and adversely affecting the economy and causing losses of wealth to the citizens of such countries.

2. Literature review

A number of studies investigated predictability and efficiency of African stock markets with mixed results. For example, using multiple variance ratio tests, Smith et al. (2002) show that Botswana, Egypt, Kenya, Nigeria and Morocco do not follow a random walk. Then, Appiah-Kusi and Menyah (2003) apply EGARCH-M model to show that stock markets in Botswana, Ghana and Nigeria are not weak-form efficient while Egypt, Mauritius, Morocco, and Kenya are weak-form efficient. In a subsequent study testing for evolving efficiency using time-varying GARCH model, Jعفرis and Smith (2005) find that Nigeria, Egypt and Morocco became weak-form efficient while Kenya and Mauritius are still not weak-form efficient. Moreover, Lagoarde-Segot and Lucey (2006) reject the random walk in Egypt and Morocco. In addition, Smith

(2008) uses joint variance ratio tests to reject the random walk in Botswana, Egypt, Ghana, Kenya, Mauritius, Morocco Nigeria and Tunisia. Similarly, using a battery of nonlinearity tests, Alagidede and Panagiotidis (2009) reject the random walk in Kenya, Morocco, Tunisia, Egypt and Nigeria. Also, studying time-varying risk premiums in Africa, Alagidede (2011) shows that investors of Kenya and Tunisia are appropriately being compensated for their bearing risks. Using FIGARCH, Alagidede (2011) provides empirical evidence to the existence of long-memory in Egypt, Nigeria, Kenya, Morocco and Tunisia. Consistent with prior studies, Ntim et al. (2011) use ranks and signs variance ratio tests and find inefficiency in Botswana, Egypt, Ghana, Kenya, Mauritius, Morocco, Nigeria and Tunisia. Recently, Smith and Dyakova (2014) classify Egypt and Tunisia to be amongst the least predictable African markets. Kenya and Nigeria belong to the most predictable stock markets. They show that most African markets are predictable in certain periods and that predictability is time-varying. Such evidence is consistent with the Adaptive Markets Hypothesis. To summarize and synthesize prior results regarding efficiency and predictability, investors should continuously search for investment ideas and strategies to beat African markets and arbitrage since predictability exists. The inefficiency could attract noise traders who might cause price bubbles.

Two recent studies examine bubbles in South Africa. Chang et al. (2016) find two bubbles in South African stock market using SADF and GSADF tests during the period 2005–2006. They argue that the cause of such bubbles was the influx of money from investors and bidding up prices of equities beyond their justified fundamentals. This regularly happens when a lot of cash tracks few investments.

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