SAJE South African Journal of Economics
ESSA The Economic Society of South Africa
South African Journal of Economics Vol. 84:3 September 2016

MEASURING THE REAL AND FINANCIAL CONNECTEDNESS OF SELECTED AFRICAN ECONOMIES WITH THE GLOBAL ECONOMY

JONATHAN E. OGBUABOR*, ANTHONY ORJI, GLADYS C. ANEKE AND OYUN ERDENE-URNUKH

Abstract
We examine the real and financial connectedness of selected African economies with the global economy using a network approach. We find that the connectedness of African economies with the global economy is quite sizable, with the global financial crisis increasing the connectedness measures above their pre-crisis levels. The results show that U.S., EU and Canada dominate Africa's equity markets, while China, India and Japan dominate Africa's real activities. Our results suggest that African economies are predominantly small open economies, deeply interconnected but systemically unimportant and vulnerable to headwinds emanating from the dominant economies in the overall global economy.
JEL Classification: F02, C53, C32, F36, N27
Keywords: Connectedness, network approach, vector autoregressive (VAR) model, global financial crisis, African economies

1. INTRODUCTION

Several studies have examined the international macro-economic linkages or commonality in macro-economic fluctuations of entities in the global economy (examples include Kose *et al.*, 2003; Doyle and Faust, 2005; Canova *et al.*, 2007; Diebold and Yilmaz, 2009, 2014, 2015a; Park and Shin, 2014; Greenwood-Nimmo *et al.*, 2015, henceforth GNS25). These studies became necessary following the rising international linkages among entities in the globe in recent decades, and the need to better model and understand the dynamics of these connections. Much of the rise in global real and financial interconnectedness has been attributed to a number of factors, mainly the current wave of globalisation sweeping across the world; the rising level of deregulation, privatisation and liberalisation across the globe; the increasing level of specialisation in production among countries owing mainly to differences in technologies and endowments; and breakthroughs in information and communications technology (Park and Shin, 2014).

Park and Shin (2014) stressed that though interconnectedness among economies could engender shared prosperity, it nonetheless encourages the rapid propagation of real and financial contagion through the global economic and financial system. A case in point is the recent 2007–2008 Global Financial Crisis (GFC), which led to decline in output growth and stock market crashes especially among African economies. There are two important lessons from this crisis. One, it has indeed shown that macro-economic linkages between African economies and the rest of the world are important and deserve

* Corresponding author: Lecturer, Department of Economics, University of Nigeria, Nsukka, Enugu State 410108, Nigeria. E-mail: jonathan.ogbuabor@unn.edu.ng

doi: 10.1111/saje.12135

to be studied. Two, these macro-economic linkages arise mainly through real connectedness that highlights the cross-country business cycle comovement and financial connectedness that shows how financial contagion is spread across the globe (GNS25; Dees *et al.*, 2007). However, apart from real and financial connectedness, Diebold and Yilmaz (2014) document other forms of linkages among entities in the global economy.

Majority of the studies evaluating the macro-economic connectedness among entities in the global economy have thus far concentrated on the highly industrialised economies like the U.S., UK, Eurozone, China, Japan, among others. For instance, Diebold and Yilmaz (2015a) focused on the highly advanced G-6 countries (*i.e.* G-7 less Canada); Diebold and Yilmaz (2014) focused on the U.S. financial institutions; Doyle and Faust (2005) and Stock and Watson (2005) both focused on the G-7 economies; Yilmaz (2009) focused on the East Asian stock markets; while GNS25 evaluated 25 countries/regions including South Africa. Clearly, the existing literature appears quite scanty on the macro-economic connectedness of African economies with the rest of the world. It is the goal of this study to fill this gap in the literature.

In view of the foregoing, this paper evaluates the real and financial connectedness of selected African economies with the global economy over the period 1981Q1–2012Q3, based on three specific objectives. First, the paper measures and analyzes the real and financial connectedness of African economies with the global economy. Second, the paper determines which of the countries in the global economy exert the most dominant influence on African economies. Third, the paper examines the impact of the 2007–2008 GFC on the real and financial connectedness of African economies with the global economy. Following established literature (*e.g.* Park and Shin, 2014; Diebold and Yilmaz, 2015a;GNS25), it is expected that African economies should be categorised as small open economies that are vulnerable to shocks emanating from the highly industrialised economies.

To achieve the above objectives, we adopt the recent connectedness-measurement technology developed by Diebold and Yilmaz (2009), which is rooted in network theory.[1] The normalised generalised forecast error variance decompositions (NGFEVDs) from the underlying vector autoregressive (VAR) model is used to build both directional and non-directional connectedness measures at various levels of aggregation. Pesaran and Shin (1998) note that the NGFEVDs obtained directly from the estimated parameters and covariance matrix of the VAR model are invariant to variable ordering and do not require any additional restrictions beyond those needed for estimation and identification.

Contrary to Diebold and Yilmaz (2015a) and GNS25, our results indicate that the roles of India and UK in the global economy can no longer be called unimportant when African economies are the focus of study. In addition, the results reveal that the connectedness of African economies with the global economy is quite substantial and that the emerging economic structure after the GFC indicates a dwindling role for the U.S. in Africa and an increasing role for Asian giants including India, China, and Japan. Among other interesting findings, the results further show that the role of the domestic economy in African equity markets declined after the GFC, suggesting loss of confidence by Africans in their own equity markets. Overall, the results are consistent with the

[1] GNS25 generalised and extended this approach to the multi-country multi-variable case. As a pioneer study providing a benchmark analysis and accounting substantially for the African economies, this paper adopts the univariate approach of Diebold and Yilmaz (2009). Subsequent analysis will be extended to the multi-variate case of GNS25 underpinned by the global VAR model.