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The global financial crisis: An analysis of the spillover effects on African stock markets

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ABSTRACT

This paper examines the relative importance of the global and regional markets for financial markets in developing countries, particularly during the US financial crisis and the European sovereign debt crisis. Specifically, we examine the way in which the degree of regional (seven African markets combined), global (China, France, Germany, Japan, the UK and the US), commodity (gold and petroleum), and nominal effective exchange rate (Euro and US dollar) spillovers to individual African countries evolved during the two crises through the econometric method introduced by Diebold and Yilmaz (2012). We find that African markets are most severely affected by spillovers from global markets and only modestly from commodity and currency markets. Conversely, regional spillovers within Africa are smaller than global ones, and hence, African markets are insulated from global crises. We also find that the aggregated spillover effects of European countries to the African markets exceeded the corresponding effects of the US, even in the wake of the US financial crisis.

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1. Introduction

The international financial linkage during crisis periods is known to be higher when spillovers across national borders are the most undesirable. The recent financial turmoil began in the housing market in the US and expanded as sovereign debt problems in Europe made stock prices plummet not only in their own markets but also in developing countries. The transmission mechanism may consist of the following two routes: a direct route from the crisis-originating countries and an indirect route from neighboring countries that are subsequently affected by the crisis-originating countries. This paper examines the relative importance of

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the global and regional effects of these events on financial markets in developing countries, particularly during the recent turmoil in the global financial markets.

Among other developing countries in Asia, Latin America, and Eastern Europe, African stock markets deserve particular attention in light of the recent strengthening of their economic links to developed countries. The historical and geographical links to Europe are obvious; for example, 45% (2012) of inward foreign direct investments (FDI) in South Africa came from the UK, and 74% (2011) of inward FDI in Morocco came from France (Table 3). The US, which has the largest economy in the world, also plays an important role in African stock markets. For example, in 2012, 59%, 42%, and 36% of foreign investment in the South African, Egyptian, and Mauritian stock markets came from the US, respectively[1] (Table 4).

We investigate the return transmissions in seven African stock markets (Egypt, Mauritius, Morocco, Namibia, South Africa, Tunisia, and Zambia) for the period between September 1, 2004 and March 29, 2013, which covers both the US financial crisis and the European sovereign bond crisis. The return transmission is measured using spillover indices that are based on the forecast error variance decompositions from the generalized impulse response function introduced by Diebold and Yilmaz (2012). The estimations of time-varying spillovers within African stock markets show how the degree of intra-regional financial interdependence was affected by the recent financial crises.

In addition to spillovers within the region, spillovers from different asset classes are made evident in other studies (Christiansen, 2010; Coudert et al., 2011; and Ehrmann et al., 2011). Christiansen (2010) investigates the volatility spillover from US (global) and European asset markets (regional) to the European national bond and equity markets (local) and shows that global, regional, and local volatility effects are all important. Coudert et al. (2011) examine the degree to which the volatilities of exchange rates in emerging countries are affected by global stock markets, emerging stock markets, and commodity markets. In addition, Ehrmann et al. (2011) find evidence of spillovers across different asset classes both domestically and internationally. To capture the spillovers from distinct regions as well as different financial markets, we include the global (China, France, Germany, Japan, the UK and the US), commodity (gold and petroleum), and nominal effective exchange rates (Euros and US dollars). Furthermore, we examine the way in which the transmissions from other financial markets to individual African countries evolve during the US sub-prime and European sovereign debt crises.[2]

We find that whereas regional spillovers within African countries are insulated from global crises, African markets are severely affected by spillovers from global markets and only modestly affected by commodity and currency markets. Conversely, the regional spillovers within Africa are smaller than the global ones. We also find that the aggregated spillover effects of European countries to the African markets exceeded the corresponding effects of the US, even in the wake of the US financial crisis.

The remainder of this paper is structured in the following manner: Section 2 provides a brief survey of the recent developments in African stock markets and discusses the financial linkages between these markets and other financial markets, and Section 3 describes the econometric approach used to examine the return spillovers among a large number of financial markets. In addition, Section 4 discusses the selection of sample countries and the determination of VAR specifications using pre-tests. Section 5 provides the empirical evidence, and Section 6 provides robustness checks and discussions. Finally, Section 7 concludes.

2. An overview of African stock markets

In this section, we review the recent developments in seven African stock markets and examine the external dependence (exports, FDI, and portfolio investments) of African markets.

The establishment of stock markets in the region extends back in history as far as the 19th century. The Egyptian Exchange is one of the oldest stock markets in Africa and the Middle East: the Alexandria Stock Exchange began in 1883, and the Cairo Stock Exchange began in 1903. Similarly, the Johannesburg Stock Exchange in South Africa was established in 1887. In 1929, the Casablanca Stock Exchange was launched in Morocco, and in 1969, the Tunis Stock Exchange was created. Newcomers include the Stock Exchange of Mauritius in 1989, the Lusaka Stock Exchange of Zambia in 1994, and the Namibian Stock Exchange in 1992.

[1] These data are obtained from the *Coordinated Direct Investment Survey* and the *Coordinated Portfolio Investment Survey*, 2014, IMF.

[2] Our strategy is to include the possible external factors in a VAR model. Alternatively, one can examine the causes of spillovers by including the possible explanatory variables in conditional correlation equations as done by Nagayasu (2013).

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