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Network, Market, and Book-Based Systemic Risk Rankings[☆]

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Abstract

We investigate the information content of stock correlation based network measures for systemic risk rankings, such as SIFIRank (based on Google's PageRank). Using European banking data, we show that SIFIRank is empirically equivalent to a ranking based on average pairwise stock correlations as developed in this paper. The correlation based network measures complement currently available alternative systemic risk ranking methods based on book or market values. A further analytical investigation shows that the value-added appears to be mainly attributable to pairwise cross-sectional heterogeneity rather than to more subtle network relations and feedback loops.

Keywords: Systemically Important Financial Institutions (SIFI), European banking sector, systemic risk ranking, network based risk measures.

JEL: G01, G21.

1. Introduction

The 2008 financial crisis and subsequent European sovereign debt crisis have led to a continuing interest in how to allocate systemic risk¹ over firms that make up the financial system; see [Tarashev et al. \(2010\)](#). Systemic risk allocation has been embedded into formal regulation by labeling some financials as Systemically Important Financial Institutions (SIFIs), subjecting them to increased capital requirements. To distinguish SIFIs from non-SIFIs, different methods have been put forward based on so-called systemic risk rankings; see [Benoit et al. \(2016\)](#) for a recent survey. Most of these ranking methodologies make use of readily available data and simple statistical measures, such as stock betas, volatilities, (tail) dependence measures, (conditional) values-at-risk, etc.

[Dungey et al. \(2013\)](#) propose a different ranking method based on network concepts. More specifically, their SIFIRank approach directly builds on the Google PageRank methodology. It does not only take into account the pairwise correlations between (financial) firms, but also the indirect linkages and feedback loops that operate in the system as a whole. Their method can be extended by including familiar firm characteristics

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¹For surveys on systemic risk research, see for example [ECB \(2009, 2010, 2011\)](#) and [Bisias et al. \(2012\)](#).

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