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Systemic risk measures: The simpler the better?

María Rodríguez-Moreno [a,*], Juan Ignacio Peña [b]

[a] European Central Bank, Neue Mainzer Strasse 66, 60311 Frankfurt am Main, Germany
[b] Universidad Carlos III de Madrid, Department of Business Administration, C/Madrid 126, 28903 Getafe, Madrid, Spain

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ABSTRACT

This paper estimates and compares two groups of high-frequency market-based systemic risk measures using European and US interbank rates, stock prices and credit derivatives data from 2004 to 2009. Measures belonging to the macro group gauge the overall tension in the financial sector and micro group measures rely on individual institution information to extract joint distress. We rank the measures using three criteria: (i) Granger causality tests, (ii) Gonzalo and Granger metric, and (iii) correlation with an index of systemic events and policy actions. We find that the best systemic measure in the macro group is the first principal component of a portfolio of Credit Default Swap (CDS) spreads whereas the best measure in the micro group is the multivariate densities computed from CDS spreads. These results suggest that the measures based on CDSs outperform measures based on interbank rates or stock market prices.

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1. Introduction

Systemic risk appears when generalized malfunctioning in the financial system threatens economic growth and welfare. The causes of this malfunction are multiple and therefore a single measure of systemic risk may neither be appropriate nor desirable. The financial system plays a fundamental role in the global economy as the middleman between both agents who need to borrow and those who are willing to lend or invest and is naturally linked to all economic sectors therefore, if the financial system does not work properly, its problems have a strong impact on the real economy. For this reason, policymakers, regulators, academics and practitioners should pay close attention to the soundness and stability of this sector.

The causes of malfunctions can be related to multiple mechanisms such as macro imbalances (e.g. excessive credit expansion in the private or public sector), correlated exposures (e.g. herding behavior), contagions, asset bubbles, negative externalities (e.g. banks too big to fall) or information disruptions (e.g. freezes in the interbank market). Given this lengthy but incomplete list of possible mechanisms influencing systemic risk, it seems safe to posit that more than one risk measure is needed to capture its complex nature, in particular, that policymakers charged with the responsibility of ensuring financial stability should rely on a wide array of measures. These measures should detect at least two kinds of situations and cover two different groups of potential systemic risk's detectors. They should warn of a persistent build-up of imbalances within the financial sector or be able to capture the abrupt materialization of systemic risk. With regard to the potential systemic risk's group detector, measures should be based on the aggregate market level (e.g. interbank rates, stock market and CDS indexes) or at the level of individual institutions. For the sake of clarity we will refer to those groups as macro and micro group, respectively. These kinds of indicators should be underpinned by measurable patterns of systemic stability which form the basis for early warning and correcting. If a systemic risk measurement indicates that destabilizing systemic events are looming, preventive policies such as stricter financial regulation and more rigorous supervision may be justified.

In the years leading up to the crisis in August 2007, we witnessed some of the above mentioned malfunctions. Explosive growth in the US subprime market, unprecedented increase in credit in private sector in the UK, Ireland and Spain, generalized external imbalances in many Western countries and of course, once the crisis started, the Lehman Brothers bankruptcy and persistent stress in the European and US banking sectors are examples of the most salient events. As a consequence, from 2007 to 2009,

* Corresponding author. Tel.: +49 691 344 8690.
E-mail addresses: maria.rodriguez_moreno@ecb.int (M. Rodríguez-Moreno), ypenya@eco.uc3m.es (J.I. Peña).

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