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Where is the system?[☆]

Sylvain Benoit[1]

Univ. Orléans, Laboratoire d'Economie d'Orléans (LEO), Rue de Blois – B.P. 6739, 45067 Orléans Cedex 2, France

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The aim of this paper is to determine the optimal size of the system (global, supranational or national) when measuring the systemic importance of a bank. Since 2011, the Basel Committee on Banking Supervision (BCBS) has tagged global systemically important banks (G-SIBs) and has imposed a higher regulatory capital of loss absorbency (HLA) requirement. However, the identification of G-SIBs may overlook banks with major domestic systemic importance, i.e. the domestic systemically important banks (D-SIBs). This paper describes how to adjust market-based systemic risk measures to identify D-SIBs. In an empirical analysis within the eurozone, I show that (i) the SRISK methodology produces similar rankings whatever the system used. However, (ii) the SRISK values greatly vary across systems, which calls for imposing the higher of either D-SIB or G-SIB HLA requirements. Finally, (iii) the ΔCoVaR methodology is extremely sensitive to the choice of the system.

1. Introduction

Since September 15, 2008 and the collapse of Lehman Brothers, extensive research has been done on systemic risk, considering its definition, measurement, or regulation. While there is no unanimous

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[1] Tel.: +33 2 38 49 49 44.
E-mail address: sylvain.benoit@univ-orleans.fr

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definition for systemic risk yet, most definitions agree on three points that are summarized in the 2011 G-10′s definition:

> "Systemic financial risk is the risk that an event will trigger a loss of economic value or confidence in [sic] a substantial portion of the financial system that [sic] have significant adverse effects on the real economy."

Thus, a systemic event corresponds to a *trigger point* which causes *significant disruption in the financial system* and finally *spreads out to the real economy*. For instance, the initial shock can be the bankruptcy of a financial institution, which sets off wide turmoils propagating through the financial system and finally jeopardizing the local and/or global economy. The key element that concerns systemic risk is the identification of Systemically Important Financial Institutions (SIFIs), which correspond to firms that threaten the system. The nature of the system is well addressed in the context of the United States because of its particularity as a federal state. However, in Europe, where we are faced with a sum of countries, the issue is much less obvious. Hence, considering global or domestic systemically important banks (G- or D-SIBs) does not lead to the same conclusions and raises numerous questions. Should we evaluate the contribution of a given financial institution to the risk of the system at a domestic, supranational, or global level? Is the list of SIBs identical if we change the system used in the analysis? Most importantly, which definition of the system should be used in the identification process of SIBs?

The objective of this paper is to determine the optimal size of the system when measuring the systemic importance of a bank. To answer the above questions which are crucial for banking regulators, I adjust market-based systemic risk measures, usually used to identify G-SIBs, to identify D-SIBs. This approach is closely tied to the current regulatory debate on systemic risk. Indeed, following a request made by the G20, the Financial Stability Board required an extension of the G-SIBs to include D-SIBs in October 2012. The Basel Committee on Banking Supervision (BCBS) published a framework for dealing with D-SIBs (BCBS, 2012) in line with its former methodology for assessing G-SIBs (BCBS, 2011 and 2013b). This country-by-country approach requires regulators to take into account a set of new bank-specific factors such as size, interconnectedness, financial institution infrastructure and complexity of a particular bank within its own financial system. BCBS emphasizes that national regulators should establish their own list of D-SIBs. By analogy, identifying the supranational-SIBs should be done by a supranational regulator while identifying the G-SIBs should be done by a global regulator which assesses the system in the global context like the BCBS currently does.

This top-down approach implies that additional capital and tighter monitoring of G-SIBs are of the utmost importance if we want to avoid a wave of major bankruptcies that would affect the entire global system. A G-SIB is usually so large, interconnected and non-substitutable that we cannot miss it in the identification process. However, the fact that a particular bank cannot be seen at the global level does not imply that its contribution to systemic risk is null. Thus a bank could be a D-SIB without being identified as a G-SIB and its impact on other domestic banks could be significant and eventually destabilize the local economy. This is why, a bottom-up approach should be adopted. Taking D-SIBs into account in elaborating the regulation is even more important if we think that, for a given bank, its systemic contribution is probably larger in its country than abroad. For this reason, BCBS requires national authorities to calibrate the level of Higher Loss Absorbency (HLA) needed for D-SIBs. Consequently, the identification of SIBs changes depending on the system we focus on.

To deal with domestic systemic risk, two fundamental questions have to be addressed. First, what is the nature and the magnitude of the initial shock to identify D-SIBs? Should we consider a global systemic event or a domestic shock? Second, what should be the *system*? What should be the optimal perimeter of the system as well as its specific risk factors and the number of banks to be taken into account? Should we investigate the same banks at the global and domestic levels? Should we use a multi-industry system or only the banking system? This paper aims to answer these questions. Another important aspect of systemic risk debate concerns the optimal taxation of SIBs. Indeed, as in the polluter pays principle, negative externalities created by SIBs have to be internalized by themselves and not by the taxpayer. In maximizing their private benefits, individual banks may rationally choose outcomes that are suboptimal on the system-wide level because they do not take