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A Systemic Importance Score for Identifying Systemically Important Banks

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Abstract

After the recent global financial crisis, great focus has been raised on the identification of systemically important banks. Therefore, simple and intuitive indicators on banks' systemic importance are urgently needed. This paper provides a new estimation method to measure and identify systemically important banks. We define quantitatively a systemic importance score (SIS) as the expected number of bank failures in the banking system given one particular bank fails. The SIS concentrates mainly on an existence of a contagion effect in an average meaning. In the empirical analysis, the SIS index is applied to identify the systemically important banks of China. The empirical results demonstrate that the big five state-owned banks are systemically important banks. Besides, IB, SPDB and CMB are also perceived as systemically important.

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Key words: systemic risk; systemically important banks; Chinese banking system

1. Introduction

Since the recent global financial crisis, a growing amount of literature began to study the overall risk in the financial system and has developed models for risk integration or aggregation [1-3]. Considering the long-lasting, destructive effect of financial crisis, the authorities and regulators may have an incentive to prevent the failure or impairment of a large, highly interconnected financial institution because such a failure or impairment would potentially pose an unavoidable risk to the whole financial system and consequently harm the real economy. Once contagious risk begins spreading, authorities have limited alternatives to stop it, thereby undermining financial stability. At this time, a supporting bailout to restore financial stability during the crisis is quite necessary. There exists a debate on support or objection of bailing out large financial institutions. A common supporting argument holds that if a particular financial institution is "too big to fail", it should be bailed out. However, the correctness of such an assertion needs careful verification. The primary

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question is to decide which financial institutions should be favored by authorities. Thus, to design an appropriate measure on identifying the systemic importance of financial institutions is the major difficulty. More specifically, we need to measure the degree to which the failure of a particular bank will contribute to the systemic risk.

A multitude of academic contributions have been devoted to measure the systemic importance of banks. The indicator-based measurement approach proposed by the Basel Committee on Banking Supervision [4] provides an assessment methodology which takes account of five dimensions of systemic importance: size, interconnectedness, substitutability, complexity and the cross-jurisdictional activity of a bank to define global systemically important banks (G-SIBs). As a result, the regulators have identified 29 banks as G-SIBs. Afterwards, the Group of Twenty [5] considers the expeditious extension of the G-SIB requirements to domestic systemically important banks (D-SIBs) based on 12 principles.

Also, some scholars try to figure out the systemic importance of financial institutions by introducing new items emphasizing on the potential systemic impact if one or several particular financial institutions fail. Before calling for a strategy to regulate the financial system as a whole, Bernanke [6] addressed the problem of financial institutions that are deemed “too big to fail” or “too interconnected to fail”. Besides, Rajan [7] focused on the item “too systemic to fail” to identify the institution whose business interacts in complex ways with the financial system and will cause systemic consequences once fails. Otherwise, Moore and Zhou [8] thought that engaging in non-traditional banking activities towards a more diversified positions will enhance the systemic importance of a financial institution, namely “too non-traditional to fail”.

As for more measures on systemic importance, recent empirical studies have put forward several applicable approaches. One is the conditional Value-at-Risk (CoVaR) measure conceptualized in Adrian and Brunnermeier [9]. CoVaR quantifies the extent to which financial distress of a financial institution can increase the tail risk of other institutions and depicts its marginal contribution to the overall systemic risk. Further speaking, systemic importance of one particular institution to the system is measured when treating all the other institutions as a whole. The setup of the CoVaR measure indicates that it calls for sufficient, high-frequency market data, such as equity price data stream. This makes it more applicative for developed countries with an advanced financial market. Developing countries like China usually possess a restricted financial market with a small amount of listed financial institutions, thus making it not applicable. Another is the Shapley value methodology applied by Tarashedv et al. [10] to a stylized banking system consisting of 60 international banks to estimate the correlation among three drivers of systemic importance. Their empirical results show that size of a financial institution is by far the principal determinant of systemic importance. With the Shapley value measure, the degree of systemic importance is measured by the share of systemic risk that is attributed to each of them based on its average contribution to the risk of all groupings of institutions. Although the Shapley value measure is very intuitive in interpretation and flexible in application, it requires a large amount of calculation to prohibit its empirical application to a large financial system [8].

Although a number of methods and indicators on bank’s systemic importance have sprang up, some potential downsides make them not easy to carry out and non-intuitive. For example, the indicator-based measurement considers five dimensions of systemic importance, thus practically needs a large sample of banks and plentiful data for all banks that incorporates the necessary information required. This makes the implementation of such an approach seems to be difficult. Besides, measures based on high-frequency market data require that the financial market meet efficiency-market hypothesis, thus not applicable for developing countries like China. Therefore, some simple yet intuitive indicators on systemic importance are urgently needed.

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