

# Multi-CoVaR and Shapley value: A Systemic Risk Measure

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## Abstract

In this paper I propose a systemic risk measure to efficiently capture the systemic importance of each financial institution within a given system. The term systemic risk refers to the contagion risk to which each bank contributes to the financial system. The whole procedure is split into two parts: 1) calculate the total systemic risk, 2) use an allocation rule to attribute the total risk to each financial institution. For the first step, I define a measure “Multi-CoVaR” to estimate the total systemic risk, which also measures the institution’s marginal contribution to the systemic risk given that a set of institutions is in distress. For the second step, I apply the Shapley value methodology to allocate the total systemic risk. The additivity property of Shapley value ensures that the macroprudential tool can be efficiently implemented at the individual level.

Keywords: Systemic Importance, Contagion Risk, Shapley Value, Macroprudential Regulation

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