Measuring and managing systemic risk

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In the wake of the current financial crisis, there is an ongoing debate on the importance of managing systemic risk in the financial sector. Much of the conventional regulation focuses on the safeguarding of the solvency of individual firms using for example the Value at Risk (VaR) or Conditional Tail Expectation (CTE) metric. The recent crisis has highlighted the importance of systemic risk and the shortcomings of pure firm specific regulation. Brunnermeier has noted that measures that are prudential at the the micro level need not be prudential at the macro level and together with his coauthors introduced an extension of Var known as CoVaR to include the impact of systemic risk. This paper proposes the use of the Co Conditional Tail Expectation (CoCTE) to measure systemic risk since it has some advantages over CoVaR. We explain how CoCTE can be used in constructing a fund to protect the financial sector in times of severe crises. When the fund is financed through the contributions of individual companies based on their relative risk contribution towards the whole system, one major question is how to determine each member's contribution, and consequently the premium for this insurance program. We suggest a possible solution to this problem using the generalized CoCTE risk measure.

The second goal of this paper is to endogenize the pro-cyclicality of capital requirements. Current regulatory frameworks, such as Basel I and Basel II, have been criticized for their role in the ongoing financial crisis. In particular, it is argued that the regulations by their nature require higher (lower) level capital in economically bad (good) times and may serve to encourage bubbles and deepen recessions. For example, in times of crisis more capital constraints are put on banks, as banks suffer from operational losses and reduction in the value of the assets. One possible way to solve this problem is to use a regime switching model. We combine this with a modified CoCTE that can be used to determine premium contributions. This metric manipulates the regime switching structure of the underlying model and provides a counter-cyclical contribution of each firm towards the protection fund. Finally we show how to apply these tools in practice.