

Measuring Contagion-Induced Funding Liquidity Risk in Sovereign Debt Markets

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Summary

The euro-area sovereign debt crisis demonstrated how systemic funding liquidity risk built up in the sovereign debt market when the sovereign credit risk of Portugal caused contagion to Italy and Spain which are systemically important sovereigns. The crisis suggests the existence of a 500-bp threshold of Italian bond spreads, above which a systemic funding liquidity shock might occur. This paper proposes a model based on the probability density associated with the dynamics of the sovereign bond spreads to measure contagion-induced funding liquidity risk in the euro-area sovereign debt market. The two risk measures with closed-form formulas derived from the model are: (1) the rate of change of the joint probabilities (RCProb) above the thresholds of sovereign bond spreads of the systemically important countries (Italy and Spain) and the small country (Portugal); and (2) the distress correlation of the probabilities of the thresholds being breached, which can provide a forward-looking signal of the contagion-induced systemic funding liquidity risk. The RCProb was almost zero before its signal materialized in April 2011 when the sovereign bond spreads were above their endogenous critical levels for the signal but thresholds had not yet been breached. Subsequently, a liquidity shock occurred in the sovereign debt market during November 2011.

Our empirical results show that the contagion-induced systemic funding liquidity risk in the euro-area sovereign debt market is driven by market liquidity in the cross-currency swap market, funding costs in euro-area banks, risk aversion levels and equity market performance. When the macro-financial variables associated with these determinants pass through certain levels, funding liquidity risk rises sharply.