# A Structural Model of Sovereign and Bank Credit Risk

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Abstract

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In the recent past, sovereign credit took center stage in the market's perception of risk. This occurred not only because certain countries emerged as potential debtors in default, but also because some major economies showed signs of fundamental strain in their public finances. The financial market effects of potential sovereign default and ensuing bank weakness and contagion, and the undermined capability of governments to sustain the Keynesian support for their vulnerable economies demonstrate the paramount importance of accurate and rigorous risk measurement of sovereign entities and financial institutions to the field of Enterprise Risk Management.

In this paper we propose a model that is designed for this task. It builds on established credit risk methodology for corporate entities known from the seminal work of Merton, and applies an innovative approach to overcome the challenges of prior attempts to use Merton's default option argument in a sovereign debt setting. From its very basic premises, the proposed model caters to economic intuition and resorts only to explicit measures of macro economic activity and public balance sheet strength as its buildings blocks rather than use obscure implied and endogenous variables. Once we have described the general setting of the model, we differentiates sovereign entities into three distinct categories, and adapt our general arguments to each of these groups. Furthermore, thanks to the natural and thus flexible framework of the model, we readily uncover the connection between the viability of sovereign entities and the viability of the jurisdictional financial institutions like banks, and expand the dimensionality of the model to the full public finance system of a country. As we go along our exposition, we demonstrate the excellent agreement of the model results with objective gauges of credit risk in the financial markets. Finally, as we only utilize broad risk drivers applicable to the full universe of asset classes, we demonstrate how we can seamlessly incorporate sovereign and bank debt into the framework of a classical multiasset class risk model applied to an Enterprise-level portfolio.