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Counterparty Risk and the Impact of Collateralization in CDS Contracts

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(Submitted on 13 Apr 2011 (v1), last revised 21 Aug 2011 (this version, v3))

We analyze the counterparty risk embedded in CDS contracts, in presence of a bilateral margin agreement. First, we investigate the pricing of collateralized counterparty risk and we derive the bilateral Credit Valuation Adjustment (CVA), unilateral Credit Valuation Adjustment (UCVA) and Debt Valuation Adjustment (DVA). We propose a model for the collateral by incorporating all related factors such as the thresholds, haircuts and margin period of risk. We derive the dynamics of the bilateral CVA in a general form with related jump martingales. We also introduce the Spread Value Adjustment (SVA) indicating the counterparty risk adjusted spread. Counterparty risky and the counterparty risk-free spread dynamics are derived and the dynamics of the SVA is found as a consequence. We finally employ a Markovian copula model for default intensities and illustrate our findings with numerical results.

Comments:	27 pages, 2 Figures. Forthcoming in Robert Elliott Festschrift
Subjects:	**Risk Management (q-fin.RM)**; Probability (math.PR)
MSC classes:	60G, 60J
Cite as:	**arXiv:1104.2625v3 [q-fin.RM]**

Submission history

From: Igor Cialenco [view email]

[v1] Wed, 13 Apr 2011 21:27:27 GMT (34kb)
[v2] Sat, 11 Jun 2011 17:21:44 GMT (35kb)
[v3] Sun, 21 Aug 2011 22:46:17 GMT (35kb)

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