



Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich



**University of
Zurich**^{UZH}

Master of Science
in
Quantitative Finance

Master Thesis

Pricing and Hedging Counterparty Credit Risk

Candidate

Luca Dominedò

Supervisor

Prof. Dr. Erich Walter Farkas, UZH and ETH

Co-supervisor

Dr. Matthias Degen, KPMG

Co-supervisor

Dr. Dominik D. Lambrigger, KPMG

Spring Semester 2012

To my Family,
The past, the present and the future.

To Anna,
The present and the future.

Possis nihil Urbe Roma visere maius.
Horatius, **Carmen Saeculare.**

Abstract

This thesis aims to analyze the challenges around the pricing and hedging of counterparty credit risk (“CCR”) in the context of quantitative risk management from a regulatory, financial/capital and risk management point of view. We present the new CCR framework set up by the Basel Committee on Banking Supervision (“BCBS”) as well as the initiatives banks are currently implementing in this area. Further, we compare and contrast the most relevant quantitative approaches developed by academia and practitioners. The new BCBS regulatory framework under the pressure of the 2007 credit crisis (e.g. the default of Lehman Brothers and the bailout of AIG, Fannie Mae and Freddie Mac), enriches the standard pricing framework by introducing CCR evaluation. Most of investment banks are consequently willing to implement a number of mitigation actions (e.g. collateral, margin and hedges). In particular, we will analyze the organization of CCR trading desks and discuss how banks may optimize regulatory capital. The main quantitative features of a consistent credit valuation adjustment (“CVA”) pricing framework and of both static and dynamic CVA hedging strategies are analyzed.

Keywords: Counterparty credit risk, Credit valuation adjustment, Basel III, CVA desk, Wrong way risk, Unilateral CVA, Bilateral CVA, Contingent CDS.