

NOVARUM

NOVARUMGROUP.COM

Serving the OTC Derivatives Market through the
Management and Hedging of Wholesale Counterparty Credit Risk

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MISSION STATEMENT

To be the industry authority in the management and hedging of wholesale counterparty credit risk.

To create long-term sustainable economic value by leveraging expertise in the management and hedging of counterparty credit risk through strategic partnerships in the global capital markets.

COUNTERPARTY CREDIT RISK

At the end of June 2008, the Bank for International Settlements reported that gross current replacement cost reported by dealers, defined as the gross value of contracts that have a positive replacement cost after taking into account legally enforceable bilateral netting agreements, stood at \$3,859 billion. Accordingly, it would not be unreasonable to assume that the current inventory of outstanding OTC derivative contracts has created in excess of \$10 trillion of CCR

To compete effectively in the OTC derivatives market, dealers must proactively manage and hedge the CCR they originate. Without the ability to recycle scarce credit and capital resources, OTC derivative dealers will inevitably face a deterioration in underlying profitability and operating leverage

EXPONENTIAL GROWTH

One of the most significant developments to occur in the capital markets over the past two decades has been the dramatic growth of the OTC derivatives market. According to the Bank For International Settlements, the total notional of outstanding OTC derivative contracts has grown from US\$1 trillion in 1987 to over US\$684 trillion by the end of June 2008. Inevitably, the inventory of Counterparty Credit Risk ("CCR") retained by OTC derivative dealers has increased in line with this growth, further accentuated by a dramatic increase in concentration within the OTC derivatives market.

ESCALATING COSTS

An inevitable consequence of the exponential growth of the OTC derivatives market has been the emergence of credit capacity constraints, an increase in the volatility of the Credit Valuation Adjustment ("CVA") held against CCR, and an escalation in the regulatory capital cost of retaining CCR.

Credit availability is becoming increasingly constrained as retained CCR crowds out new business opportunities. This is particularly acute where customers are reluctant or prohibited from entering into margin arrangements or where netting benefits are negligible. Furthermore changes in U.S. GAAP and IAS accounting rules requiring the use of market inputs in the determination of CVA has dramatically increased earnings volatility in firms that retain large or concentrated inventories of CCR during periods of market disruption.

STRATEGIC IMPERATIVE

The management of CCR is mathematically complex, systems intensive, and organizationally challenging. Multiple functions are involved in the origination, measurement, valuation and reporting of CCR, including Derivatives Origination, Credit Risk Management, Systems Architecture, Quantitative Research, Accounting Policy, Regulatory Reporting, and Finance & Treasury. To be effective, senior management must design and implement coherent procedures, processes and policies that clearly define responsibilities and align interests between these functions in order to eliminate duplication and promote consistency, accountability and transparency.

COUNTERPARTY CREDIT RISK

CCR is defined as the current or potential positive replacement cost of an OTC derivative netting set at a specified point in time

DEFINING CCR

An event of default by a counterparty prior to the stated maturity date of an OTC derivative contract will trigger its early termination and the settlement of a close-out amount between the counterparties. The close-out amount is defined as the replacement cost of the OTC derivative contract determined by either market quotation or loss.

Where it is legally enforceable to net the close-out amounts across a portfolio of OTC derivative contracts pursuant to an event of default by a counterparty, the portfolio of OTC derivative contracts constitutes a netting set. Where close-out netting is not legally enforceable, each OTC derivative is viewed as a separate netting set.

A counterparty can default on any date up to and including the stated maturity date of the contract. While the replacement cost of a netting set is known today, its replacement cost in the future is uncertain. To address this uncertainty, the potential replacement cost of the netting set is simulated throughout its remaining life against a population of potential market scenarios. From this population of simulated replacement costs, counterparty credit risk managers construct:

- An expected positive exposure profile: the average positive simulated replacement cost at each future time interval.
- A maximum positive exposure profile: the maximum positive simulated replacement cost at each future time interval.

COUNTERPARTY CREDIT RISK

The variety of metrics used to report CCR underscores the complexity of this unique category of retained credit risk

CCR METRICS

Counterparty credit risk managers use a variety of CCR metrics drawn from the expected and maximum positive exposure profiles to measure the magnitude of credit utilization, calculate CVA, and report regulatory RWAs.

Given that the future magnitude of CCR is uncertain, counterparty credit risk managers use current, expected, and potential risk metrics to measure credit utilization. These include:

- Current replacement cost, assuming an immediate event of default by the counterparty;
- Peak expected positive exposure, defined as the global maximum of the average positive simulated replacement costs; and
- Peak maximum positive exposure, defined as the global maximum of the maximum positive simulated replacement costs.

Under U.S. GAAP and IAS accounting rules, CVA is calculated by applying the implied market credit spread of the counterparty to the expected positive exposure profile.

Under the Basel II Capital Accords, CCR is expressed as the weighted average of EPE through time, with RWAs determined by multiplying the EPE by a risk weighting reflecting the creditworthiness of the counterparty.

COUNTERPARTY CREDIT RISK

Successful risk management begins with a clear alignment of the capital and credit costs of retaining CCR with the cost of hedging CCR

OPERATING MODELS

Two types of operating models have emerged over the past decade to manage CCR:

The Credit Portfolio Model, favored by firms with an existing centralized loan portfolio management team reporting to an independent risk or financial control function. Under this operating model, CCR originated by each OTC derivative business is aggregated and managed centrally against approved portfolio limits. Risk transfer is effected through internal pricing agreements that attribute a credit and capital charge to the CCR created. The advantages of this centralized operating model are well documented and quantifiable, including: cost efficiency, corporate consistency, independence and control. The disadvantages are qualitative, centered around: perceptions of monopolistic pricing behavior and bureaucratic inflexibility. Since the cost of credit and capital represents a material proportion of the available mark-up on an OTC derivative transaction, the potential for internal dispute is significant. Therefore, for this operating model to be viable, senior management must actively moderate potential disputes through continuous consultation and education.

The Self Insured Model, favored by firms that fully allocate the cost of balance sheet and capital usage to each originating business. Under this operating model, each OTC derivative business is responsible for the credit and capital costs associated with the CCR it originates and retains. The role of the independent control function is restricted to establishing and monitoring CCR limits within which originating business units are required to operate. The advantages of this devolved operating model are qualitative, but significant. Once an OTC derivative business accepts ownership and accountability for the CCR it originates, it is invariably more proactive and innovative in the management and hedging of CCR. Disadvantages include the replication of CCR management resources across multiple business units and the cost and complexity of maintaining a consistent risk governance over these business units to ensure the validity and effectiveness of the credit risk mitigation they employ.

COUNTERPARTY CREDIT RISK

In practice, reliable portfolio decomposition under the Credit Portfolio Model has proven extremely complex and computationally onerous. Similarly, effective control and oversight of credit risk mitigation executed under the Self Insured Model has proven problematic given the variety of hedging strategies employed and the range of hedge effectiveness attained

RISK PRACTICE

CCR hedging strategies fall into two broad categories, largely dependent upon the choice of CCR Operating Model.

The Credit Portfolio Model encourages a bifurcated risk practice to align and integrate the risk management of CCR with the loan portfolio management function. Complex mathematical models are employed to disaggregate CCR into its constituent market and credit components. The market component is managed by a dedicated market risk team and the credit component aggregated with more traditional forms of credit risk.

The Self Insured Model encourages a greater variety of hedging strategies primarily focused on creating additional credit capacity to support incremental OTC derivative transactions. Most common amongst these strategies are the “dynamic hedging” of CCR using Credit Default Swaps (“CDS”) and the use of hybrid credit products specifically designed to hedge CCR, such as the Contingent Credit Default Swap (“CCDS”).

**COUNTERPARTY CREDIT
RISK**

The ease of inclusion of the CCDS in the underlying derivation of CCR offers counterparty credit risk managers the ability to simultaneously address internal credit constraints, mitigate potential CVA volatility, and reduce counterparty RWAs through the application of a single standardized hedging instrument

CCDS

Increasingly, counterparty credit risk managers are turning to the CCDS market to hedge CCR given the ease with which the CCDS can be fully integrated into the underlying computation of CCR. A CCDS is a variation of CDS where the notional amount is defined as the replacement cost of a hypothetical Reference Derivative, determined upon an event of default by the Reference Credit, subject to a minimum value of zero.

The CCDS notional amount mimics the CCR to the Reference Credit created by the Reference Derivative. Accordingly, the CCDS Reference Derivative can be introduced as a simple “contra netting set” in the derivation of expected and maximum positive exposure profiles and EPE, where the CCDS Reference Credit and underlying OTC derivative counterparty are the same legal entity.

To enhance liquidity and price transparency in the CCDS market, many dealers have developed simple optimization programs to derive portfolios of “plain vanilla” CCDS contracts to hedge even the most complex OTC derivative netting sets.

The CCDS eliminates the need to bifurcate CCR into its constituent market and credit components, eliminating the principal drawback of the Credit Portfolio Model. Furthermore, the establishment of a market standard CCDS template under the auspices of ISDA significantly simplifies the control and governance of CCR hedging under the Self Insured Model.

OUR SERVICES

Our goal is to create long-term sustainable economic value for our customers in the OTC derivatives market through the effective management, transformation, and distribution of wholesale CCR

Clients of Novarum Risk Management not only include OTC derivative dealers, but also general management consulting firms looking to enhance their understanding of CCR and software companies developing new CCR and EPE applications

OUR BUSINESS MODEL

Novarum's business model is comprised of two distinct but complementary core competencies:

CCR Consulting Practice - We deliver comprehensive advice and analysis to participants in OTC derivatives market covering all aspects of CCR management through Novarum Risk Management US LLC and Novarum Risk Management UK Limited.

Wholesale CCDS Provider - We aim to be a principal CCDS counterparty to professional dealers in the OTC derivatives market through Novarum Global Trading GmbH.

CONSULTING SERVICES

Novarum Risk Management uses a base line model to evaluate CCR management procedures, processes and policies against industry best practice. Reviews are completed by a Senior Manager on-site through individual interviews and group discussion. Engagements cover:

- The measurement and reporting of EPE; CVA under GAAP and IAS accounting rules; and counterparty RWA under the Basel II Capital Accords;
- The attribution of CVA and allocation of counterparty RWA and associated regulatory capital charges;
- The approval and monitoring of CCR using Peak EPE limits. The management of CVA volatility using VaR limits. The allocation of regulatory balance sheet through RWA limits; and
- The integration of CCR hedging into the determination of EPE, CVA and RWA. The establishment of risk priorities through limit hierarchies and the implementation of an effective corporate governance.

Based upon the results of these reviews, customers receive detailed project plans and follow-up engagements.

OUR SERVICES

To alleviate the emerging imbalance in the CCDS market, Novarum Group will be establishing a dedicated independently rated operating subsidiary, Novarum Global Trading GmbH, to provide CCDS protection to participants in the global OTC derivatives market

Novarum Global Trading GmbH was specifically designed to enable OTC derivative dealers to hedge unsecured counterparty credit risk with a highly rated counterparty under a fully margined CSA

CCDS TRADING

The development of a liquid and transparent CCDS market is in the interests of both OTC derivative dealers and market regulators. However, the current challenging market environment coupled with the complex and esoteric nature of CCR has discouraged the participation of non-bank financial institutions in the CCDS market.

To address the emerging imbalance between the supply and demand for CCDS protection, the OTC derivatives market requires a highly rated non-bank financial institution with the prerequisite risk management acumen to promote the effective regulatory risk transfer of CCR and its transformation into “plain vanilla” products, which can be more readily distributed to traditional institutional investors in the global capital markets.

COMPETITIVE ADVANTAGE

CCR mitigation is effected through the inclusion of the CCDS Reference Derivative as a simple contra netting set in the determination of counterparty EPE, giving rise to a substitution of EPE from the counterparty to the CCDS provider.

EPE to Novarum Global Trading is minimized through the application of daily cash margining under an ISDA Credit Support Annex (“CSA”) to maximize the efficacy of the CCDS. All residual EPE is secured by a floating 1st lien over the assets of Novarum Global Trading.

The capital adequacy of Novarum Global Trading will be evidenced by a counterparty risk rating from a Nationally Recognized Statistical Rating Organization. Failure to maintain at least a A- will result in the automatic early termination of all outstanding CCDS transaction at their current market value.

OUR SERVICES

While recent market events have raised concerns about the efficacy of the operating models of select CDPCs, SIVs and monoline financial guarantors, Standard and Poor's Rating Services have reconfirmed their intent to rate Novarum Global Trading GmbH based upon its proposed operating guidelines and capital model

OPERATING MODEL

The antecedent of the Novarum Global Trading operating model was stress tested and validated over a period of ten years at JPMorgan Chase and Citigroup. Market participants and regulatory agencies recognize the management team of Novarum as the market leading practitioners in the risk management of CCR.

The Novarum Global Trading operating model will be distinct from that of credit derivative product companies ("CDPCs"), structured investment vehicles ("SIVs") and traditional monoline financial guarantors. In contrast to these companies, the risk practice of Novarum Global Trading will be based upon the continuous replication and decomposition of all market and credit risks into plain vanilla OTC derivative products. Furthermore, all CCDS and associated hedge transactions will be executed under fully margined CSAs to mitigate any CCR to Novarum Global Trading.

BUSINESS PURPOSE

NOVARUM's Operating Guidelines ("OG") authorize it to execute specified CCDSs and associated plain vanilla OTC derivative hedges, (collectively referred to in the OG as "APPROVED TRADING INSTRUMENTS") with select counterparties (referred to in the OG as "APPROVED COUNTERPARTIES"), governed under standard ISDA documentation (referred to in the OG as "APPROVED DOCUMENTATION").

CREDITWORTHINESS

Novarum Global Trading GmbH was specifically structured to eliminate, to the fullest extent possible, any credit risk between itself and its APPROVED COUNTERPARTIES. Based upon the credit risk mitigation summarized below, Novarum Global Trading GmbH expects to receive an independent Counterparty Credit Rating from Standard and Poor's.

- i. All APPROVED TRADING INSTRUMENTS executed by Novarum Global Trading GmbH are governed under an ISDA Credit Support Annex ("CSA") requiring both NOVARUM and its APPROVED COUNTERPARTIES post daily cash collateral equal to the current replacement cost of all outstanding contracts.

OUR SERVICES

- ii. The potential future replacement cost of APPROVED TRADING INSTRUMENTS, over and above their current replacement cost, is determined by Novarum Global Trading GmbH at the close of each business day using a proprietary VaR Model (referred to in the OG as the "CAPITAL ADEQUACY TEST"). NOVARUM is required under the OG to maintain an amount of AVAILABLE CAPITAL, over and above any collateral paid to APPROVED COUNTERPARTIES, sufficient to fully collateralize any potential future replacement cost up to a confidence factor commensurate with its Counterparty Credit Rating.
- iii. Under the CSA, APPROVED COUNTERPARTIES are granted an exclusive first priority floating security interest over Novarum Global Trading GmbH's AVAILABLE CAPITAL. AVAILABLE CAPITAL is comprised of all financial assets held in the form of ELIGIBLE INVESTMENTS. AVAILABLE CAPITAL is funded by members' capital contribution, senior unsecured liabilities, reserves withheld, collateral from APPROVED COUNTERPARTIES, and retained earnings.
- iv. Novarum Global Trading GmbH is required to fully comply with the terms of the OG. Failure to do so, will result in the automatic early termination of all outstanding APPROVED TRADING INSTRUMENTS at their current replacement cost and the immediate dissolution of Novarum Global Trading GmbH.

CCDS STANDARD VALUATION MODEL

For the purpose of determining the CRC of the CCDS, NOVARUM and its APPROVED COUNTERPARTIES contractually agree to use the CCDS Standard Valuation Model ("CCDS-SVM"). The CCDS-SVM is derived from the risk-neutral replication of the CCDS from a portfolio of plain vanilla OTC derivative products, where future prices are assumed to be independent. The CCDS-SVM will be supported by an independent market vendor to facilitate the timely resolution of disputes.

CENTRAL COUNTERPARTY

Where required by Supervisory Authorities or requested by APPROVED COUNTERPARTIES, NOVARUM will novate/settle APPROVED TRADING INSTRUMENTS through either an industry sponsored CCP or regulated exchange.

OUR FIRM

The Novarum group of companies is currently comprised of six companies located in the British Virgin Islands, New York, London and Zug.

GROUP COMPANIES

Novarum Partners - Organized under the laws of the British Virgin Islands as a private limited liability holding company.

Novarum Risk Management US - A fully-owned operating subsidiary of Novarum Partners organized under the laws of the State of Delaware as a private limited liability company, providing risk advisory services in the Americas and operational support to Novarum Group.

Novarum Risk Management UK - A fully-owned operating subsidiary of Novarum Partners organized under the laws of England and Wales as a private limited liability company, providing risk advisory services in Europe and Asia and operational support to Novarum Group.

Novarum Group - A fully-owned holding subsidiary of Novarum Partners organized under the laws of the Swiss canton of Zug as an *Aktiengesellschaft* ("AG").

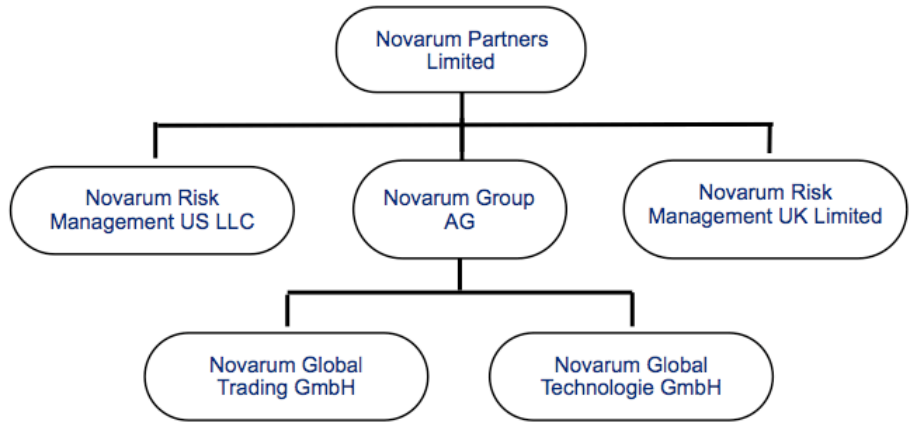
Novarum Global Technologie - A fully-owned operating subsidiary of Novarum Group organized under the laws of the Swiss canton of Zug as a *Gesellschaft mit beschränkter Haftung* ("GmbH"), responsible for the ongoing development of our proprietary valuation and risk management analytics.

Novarum Global Trading - A fully-owned operating subsidiary of Novarum Group organized under the laws of the Swiss canton of Zug as a *Gesellschaft mit beschränkter Haftung* ("GmbH"), specializing in the execution of CCDS and associated hedges in the OTC derivatives market.

OUR FIRM

Novarum Partners Limited is controlled and fully owned by the Founders and Senior Management Team of the Novarum group of companies

THE NOVARUM GROUP OF COMPANIES



OUR PEOPLE

Our market experience is unparalleled, enabling us to provide our customers with comprehensive advice covering all aspects of CCR industry best practices

MARKET LEADERSHIP

The professionals of Novarum have been at the vanguard of CCR management and hedging for over a decade. Our senior management team:

- Pioneered the “dynamic hedging” of CCR at Chase Manhattan Bank in the late 1990s;
- Were instrumental in the creation of the CCDS at Citigroup in 2002; and
- Spearheaded discussions with the regulatory authorities to include the CCDS as an effective counterparty credit risk mitigant under the Basel II Capital Accords.

FOUNDERS

Andrew Paul Hollings

Andrew Hollings is a Co-Founder of Novarum. He is based in New York.

Prior to the establishment of Novarum in 2008, Andrew Hollings held the position of Managing Director in Citigroup Global Markets Inc. and President of Citigroup Counterparty Risk LLC. Mr. Hollings joined Citigroup in 2002 to establish a global Counterparty Credit Risk management function. Prior to joining Citigroup Global Markets, Mr. Hollings held the position of Managing Director and Global Head of the New Financial Products Group at JPMorgan Chase. His responsibilities included actively managing the counterparty credit risk for the global OTC derivatives business. Mr. Hollings established the New Financial Products Group in Chase Manhattan Bank, prior to its merger with JPMorgan. In this role he was responsible for managing a team that traded a portfolio of complex hybrid risk products. He has previously held various positions in the Fixed Income business of Chemical Bank and Manufacturers Hanover Trust in London, Tokyo and New York. Mr. Hollings has 20 years of experience in the derivatives industry.

Andrew Hollings received a BSc (Hon) in Economics & Finance and an MA in Economics from the University of Wales, College of Cardiff.

OUR PEOPLE

Shankar Mukherjee

Shankar Mukherjee is a Co-Founder of Novarum. He is based in London.

Prior to the establishment of Novarum in 2008, Shankar Mukherjee held the position of Managing Director in Citigroup Global Markets Limited in London. Mr. Mukherjee joined Citigroup in 2003 to establish the Counterparty Credit Risk management function for Europe and Asia. Prior to joining Citigroup Global Markets, Mr. Mukherjee held the position of Managing Director of the Credit Portfolio Group at JPMorgan Chase. In this position Mr. Mukherjee was responsible for pricing of new transactions in the derivatives and loan space. He was also responsible for formulating and implementing policies related to the hedging of the bank's credit exposure based on risk and capital considerations. Prior to this Mr. Mukherjee was the European co-head of the New Financial Products Group in Chase Manhattan Bank where he traded a portfolio of complex hybrid risk products. He has previously held various positions in the Fixed Income business of Chemical Bank and Citibank in London, Tokyo, New York and Mumbai. Mr. Mukherjee has 18 years of experience in financial markets.

Shankar Mukherjee received a BE(Hon) in Electrical and Electronics Engineering from BITS, Pilani, India and an MBA from the Indian Institute of Management, Calcutta, India.

Svein Stokke

Svein Stokke is a Co-Founder of Novarum. He is based in Zug, Switzerland.

Prior to the establishment of Novarum, Svein Stokke held the position of Director in Citigroup Global Markets Inc. Mr. Stokke joined Citigroup in 2002 to develop Credit Risk analytics and establish the Contingent Credit Risk trading desk. In his position as Head of Contingent Credit Risk Trading, he managed a team of Contingent CDS traders and Quantitative Analysts. Before joining Citigroup Global Markets, Mr. Stokke was employed as a Quantitative Analyst and Fixed Income trader with Chemical Bank in Europe. Later, he relocated to New York working with Counterparty Credit Risk analytics at JPMorgan Chase. Prior to his career in finance, he worked as an army officer and as a researcher. Mr. Stokke has worked in Oslo, London and New York and has 13 years of experience in the derivatives industry.

Mr Stokke received an MSc in Control Engineering from the Norwegian University of Science and Technology and an MBA from Warwick Business School, UK.

OUR PEOPLE

MANAGEMENT TEAM

Kristel Adler

Kristel Adler is a Director of Novarum Risk Management US LLC. She is based in New York.

Prior to the establishment of Novarum, Kristel Adler held the position of Associate in Citigroup Global Markets Inc. Ms. Adler joined Citigroup Counterparty Risk in 2005 and has held several positions while there, including those of Contingent Credit Risk Trader, Quantitative Analyst, and Business Analytics Developer. Prior to joining Citigroup Counterparty Risk, Ms. Adler worked as a Quantitative Researcher in Citigroup's Emerging Markets Fixed Income Quantitative Research Division.

Ms. Adler received a BScE in Electrical Engineering (Magna Cum Laude) from Princeton University, Princeton, NJ, USA.

Ganesh Kandasamy

Ganesh Kandasamy is a Director of Novarum Risk Management US LLC. He is based in New York.

Prior to the establishment of Novarum, Ganesh Kandasamy held the position of Vice President in Citigroup Global Markets Inc. Mr. Kandasamy joined Citigroup in 2005 to build a scalable technology platform for Counterparty Credit Risk Management application. In his position, he enhanced the risk management application using J2EE framework, implemented pricing and valuation models for various derivative products, and built Monte Carlo simulation based Capital model for achieving AAA rating from major ratings agencies. Before joining Citigroup, Mr. Kandasamy was employed as a senior associate with Morgan Stanley in New York where he built the technology platform for investable Hedge Fund Index business. Prior to his career in finance, he worked as senior technical staff at AT&T. Mr. Kandasamy has 16 years of experience in the information technology industry.

Ganesh Kandasamy received a BE in Computer Science and Engineering from Guindy Engineering College, Chennai, India and an MBA from Rutgers University, NJ, USA.

OUR PEOPLE

Helen Kim

Helen Kim is a Director of Novarum Risk Management US LLC. She is based in New York.

Prior to the establishment of Novarum, Helen Kim held the position of Vice President in Citigroup Global Markets Inc. Ms. Kim joined Citigroup Counterparty Risk in 2003 as a Contingent Credit Risk Trader. In her position, she also participated in various discussions with the Rating Agencies and Regulators involving capital and risk measurements related to counterparty credit risk. Prior to joining Citigroup Counterparty Risk, Ms. Kim was a trader in Citigroup's loan portfolio. She started off her career in finance at Citigroup as an investment banking analyst in the Global Energy Group. Ms. Kim has 9 years of experience in the financial industry.

Helen Kim received a BSE in Finance and Strategic Management (Cum Laude) from The Wharton School of the University of Pennsylvania, Philadelphia, PA, USA.

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