

## **ALEJANDRO DUARTE**

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### **SUMMARY**

Alejandro Duarte has hands-on expertise designing and developing data-driven models, trading strategies and risk management tools. He has extensive experience in Data Science and Financial Modelling/Engineering and has focused in helping different businesses by delivering modelling solutions to support the decision making process of portfolio managers, traders, risk managers and auditors.

Prior to joining BRG, Mr. Duarte was the cross-asset quantitative strategist for the Global Macro Fund at Citadel, where he conducted extensive statistical analyses of the market dynamics to design trading strategies and statistical tools to identify market opportunities.

Previously, he worked for Morgan Stanley, WestLB, ABN AMRO, UBS and CITI in a variety of roles involving statistical/quantitative analysis, strategy, trading as well as both wholesale and retail risk management.

His experience spans all major asset classes i.e. FX, Rates, Equities, Commodities and Credit, and his approach is to leverage the use of analytics and technology for the benefit of the business.

Mr. Duarte holds a PhD in Mathematical Physics/Nonlinear Dynamics from the Balseiro Institute at Argentine Atomic Energy Commission, and a Masters from the School of Operations Research and Information Engineering at Cornell University.

### **PRESENT EMPLOYMENT**

July 2014 to current: Director, Berkeley Research Group

### **PREVIOUS POSITIONS**

March 2013 to March 2014: Cross-Asset Global Macro Quantitative Strategist, Citadel.

Dec 2009 to Aug 2012: Trading Desk Strategist / FXEM, Vice President, Morgan Stanley.

Feb 2007 to Dec 2009: Structured Credit Trading, Director, WestLB.

Jan 2006 to Jan 2007: Quantitative Analyst, Associate Director, Credit, Hybrids Commodity and Inflation Derivative Analytics and Structured Derivatives, ABN AMRO

Sep 2003 to Dec 2005: Quantitative Analyst, Associate Director, Equities Quantitative Strategies, UBS Investment Bank

June 2002 to June 2003: Quantitative Analyst, Capital Credit Holdings (Investment Banking Boutique start-up)

Aug 1997 to Oct 1999: Statistical Portfolio Modelling and Credit Policies, Citibank (Consumer)

## **PROFESSIONAL AFFILIATIONS**

FSA approved for CF30 Customer, Dec 2007 – March 2014

## **PROFESSIONAL AWARDS, RECOGNITION, AND PRIZES**

2000-2002 FULBRIGHT Scholarship

## **EDUCATION**

MEng, Operations Research/Financial Engineering, School of Operations Research and Information Engineering, Cornell University, 2002

PhD, Mathematical Physics/Nonlinear Dynamics, Balseiro Institute at Argentine Atomic Energy Commission, 2001

## **PAPERS & PUBLICATIONS**

Published several research papers in peer reviewed journals including Physical Review A, Physical Review B, Physics Letters A, Physica A and the American Journal of Physics.

## **PREVIOUS EXPERIENCE**

### **Data modelling engagements**

#### ***Market modelling***

- Conducted extensive time series pattern recognition studies in different asset classes FX, Rates, Equities, Commodities and Credit and their impact on different strategies and structures.

- Developed cross-asset data-driven models to exploit opportunities arising from changes in the correlation structure of assets in the global markets i.e. Equities/Commodities, Rates/Commodities, Rates/FX, Commodities.
- Designed framework to model, monitor the market and identify cross-asset opportunities.
- Developed analytics library and a variety of tools which were used to conduct several market studies.
- Implemented interfaces for users to be able to access the analytics library using the web and/or Excel
- Developed a suite of tools to monitor the market to identify opportunities; and implemented the following historical series monitors
  - Cross-asset relative value volatility
  - Intra-market statistics for Commodities, Equities, Rates and FX
  - Cross-asset statistics within country/region
  - Cross-asset correlations and its changes
  - Conditional cross-asset correlations
  - Several monitors to rank forward swaps according to several attributes i.e. deviations as measured by benchmark normalization or deviations with respect to implied by correlation dependence.
  - Forwards butterflies ranking and structuring
- Conducted back-testing and several analyses on the performance of the different strategies under different scenarios
- The library implements various statistical tools and regression methods i.e. MLR, PCA, Factor Analysis and is readily extensible.
- Back-tested trading and hedging strategies and analysed their performance for different market regimes

### ***Portfolio modelling***

- Developed predictive statistical models for the default probability of credit card portfolios and used these models to advice on credit policies, risk management and marketing.
- Conducted segmentation and clustering studies and advice on the profitability of segments and the identified socioeconomic clusters of high delinquency enabling a better use of the bank resources.

## **Valuation and risk quantification engagements**

- Developed and implemented many pricing and risk management models for structured derivatives with exotic features and hybrid risk exposures.
- Adapted and/or extended existing models to handle proposed transactions with new structural features.
- Conducted risk management of portfolios with hybrid exposure, and analysed ways to re-engineer these portfolios to control their risk profile with respect of different exposures.
- Provided P&L and risk attribution for several transactions.

## **Best practice reviews**

- Conducted models reviews, critiques and extensions by validating and stress testing assumptions and inputs.
- Researched and different methodologies and tools to analyse market dynamics and identify different market behaviours.
- Conductive extensive back-testing studies of trading and hedging strategies.
- Validated the effectiveness of hedging strategies for different periods of time.
- Liaised with controllers and risk managers to design ways to assess the validity of pricing assumptions and inputs on an ongoing basis, and evaluated the potential impact on portfolios arising from changes in these assumptions.
- Developed the risk policy & procedures for consumer credit approvals and the review and monitoring of existing customers.
- Provided stochastic capacity model and advice for resources allocation in a consumer bank sales department to achieve a more efficient use of resources.
- Developed valuation methodologies for illiquid assets and participated in discussions with the valuation review group on an ongoing basis.
- Developed methodology for calculating of different P&L reserves, including Bid-Offer and Liquidity, and provided monthly calculation updates.

## **Transactional advisory**

- Provided pricing and risk management advice for several issuances of Convertible Bonds, including exotic features like Resetable and Hybrids (FX and Commodities), and other Structured Equity derivatives.
- Provided pricing and risk management advice for several issuances of Credit Linked Notes and other Structures Credit structures.
- Advised structuring teams on the risk and valuation implication of many complex transactions.
- Liaised with risk managers and controllers to advise them regarding the proper ongoing internal representation of the risk in many trades and their monitoring.
- Worked with IT groups and operations to ensure the models of the transactions are properly implemented.
- Provided pricing for the structuring and issuance of Auto Lease Receivables Securitisation, including the risk management and credit rating of the structure.
- Provided pricing modelling for the securitisation of several portfolios, including a Life Settlements securitisation, a Collateralized Fund of Hedge Funds Obligation, and a Commercial Real Estate Mortgage portfolio.

## **Technology engagements**

- Interfaced between businesses, modelers and solution developers to ensure systems reflect the correct modeling methodologies and inputs, and are suitable for the business.
- Design and developed many prototype solutions based on research/testing of existing technologies and interacted with relevant IT groups for the implementation in production systems.
- Designed and developed a tool for investigating and designing model based strategies, their analysis, and back-testing. The flexibility of the tool allowed the use of different types of asset classes (FX, Interest Rates, Credit, Equities, Commodities) and different products within each asset class (Spot, Futures, Bonds, CDS, Indices as well as different type of modelling approaches.
- Implemented a variety of interactive visualization tools to quickly analyse historical data.
- Designed and developed a robust tool for market making of Bonds which enabled the desk to move away from an unstable spreadsheet based platform. Interacted with end-users to understand the practical aspects of their needs and design the proper functionalities and user interfaces.
- Designed and developed systems using different technologies depending on the needs of the business.