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Background and Experience

2012-2014, 2019-Present **Thornapple Associates, Inc., Associate**
Provide analytic and testimonial expert witness services in connection with trials, arbitrations and regulatory proceedings related to the securities and commodities industries. Expertise spans options, exchange-traded products, mutual funds, closed-end funds, commodities, commodity pools, futures, OTC derivatives, capital markets, portfolio management, trading strategies, volatility, leverage, risk analysis, performance attribution, index analysis, statistical methods, simulation and quantitative techniques.

2019-Present **Fintelligere, LLC, Managing Shareholder & Principal Consultant**
Create artificial intelligence (AI), data science and analytical solutions for financial services clients. Client engagements span automation, machine learning (ML) and business intelligence objectives.

2014-2019 **Legg Mason Global Asset Management, Product Strategy & Development Manager**
Researched, collaborated and led cross-functional initiatives across product strategy, design, development, positioning, enhancements, due diligence and trading. Developed statistical models and innovative analytics to elicit actionable insights into market demand, competition and optimal product features. Presented recommendations to senior management and fund board committees. Advised and mentored colleagues on investment strategy, derivatives and data science techniques. Co-founder and co-chair of veteran employee resource group.

2009-2012 **Factor Advisors, Managing Director & Co-Founder**
Oversaw and drove the creation of FactorShares exchange traded funds (ETFs) representing the first family of factor ETFs. Coordinated the entire pre-launch process with all stakeholders including lawyers, employees, underwriters and service providers. FactorShares listed on NYSE Arca in 2011 and were structured as futures-based commodity pools. Surmounted the regulatory challenges to launch innovative alternative ETFs. In 2012, Factor Advisors was sold to a private equity firm. Built a diverse 10-person team across sales, marketing, compliance, research, operations, technology, finance and administration. Instilled and fostered a sound corporate governance, compliance and controls environment; awarded rare "no deficiency" letter for initial NFA audit in 2012. Negotiated with lawyers and executed dozens of agreements with trading counterparties, marketing partners, service providers, vendors, consultants and employees. These included: Standard & Poor's, State Street, Interactive Brokers and top-tier global investment banks. Coordinated intellectual property and licensing initiatives with lawyers: drove and executed licensing agreement for our trademark '*facto*r' with a large investment firm. Originated and disseminated unique investment insights and market perspectives eliciting hundreds of media interviews across TV, web, print and radio venues.

Background and Experience, cont'd

2005-2009 **Credit Suisse Volaris, Senior Portfolio Manager, Director**
Directed and oversaw the discretionary position and risk management of 100+ separate account and mutual fund portfolios consisting of listed and OTC options with a notional value in excess of $5 billion. Originated limit orders and worked closely with trading team to ensure trades were executed in a timely and advantageous manner. Adapted to dynamic markets and adjusted risk tolerance levels accordingly. Interacted frequently with relationship managers, advisors and clients to discuss strategy, performance and investment process. Mentored and led junior portfolio managers, traders and analysts. Managed hedging program for USAA property and casualty equity portfolio. In 2008, averted $400 million in losses causing +1% portfolio return [compared to -37% return for S&P 500]. Senior options strategist & sub-advisor for USAA & Prudential 1940 Act investment funds with AUM in excess of $1 billion. Worked with sales team to generate client leads, pitch new business and close new mandates. Spearheaded research efforts to improve existing products, strengthen risk management processes, leverage technology and develop new options strategies. Served as a thought leader building brand awareness through original research, speaking engagements and publications.

2003-2005 **Rampart Investment Management, Trader/ Portfolio Manager, VP**
Portfolio management responsibilities for 300+ concentrated stock accounts valued at over $800 million. Monitored daily stock and option markets for tradeable events pertaining to covered call strategies. Determined trading course of action and worked with Merrill Lynch's HNW advisors to efficiently execute option trades. Oversaw and managed option-overlay strategy for Eaton Vance's $750 million Enhanced Equity Income Fund (EOI). Closed-end structured portfolio employed Rampart's call-overwrite strategy to enhance equity income through the sale of equity calls. Managed BXM™ (covered call) accounts valued at over $50 million and provided protective equity (long put) advisory services on $100 million in asset allocation accounts at Clark Capital. Designed and developed web-based portfolio, trading and risk management system that was customized to option overlay portfolios. Created automated interface to back office to relay accurate and timely trading results -- eliminated the need for a new Operations employee.

2000-2003 **Grantham, Mayo, Van Otterloo (GMO), Investment Analyst**
Worked with the Director of Quantitative Research in developing, testing and implementing innovative asset allocation models, optimization techniques, alpha strategies and risk models. Developed Matlab interface to CPLEX system for advanced portfolio optimization spanning linear, quadratic, and mixed integer programming techniques. Developed automation solutions and provided timely analytic support for investment heads, portfolio managers and marketing professionals. Designed portfolio risk system, web-based portfolio tools and Excel macro processes for performance attribution, index analysis and data solutions across Factset, Bloomberg and Datastream vendor systems.

Publications

Reliance and Loss Causation in Securities Fraud Class Certification Motion Practice After Halliburton II, *Securities Reform Act Litigation Reporter*, Vol. 37, Nos. 3 & 4, at 35 (Symposium on effect of Halliburton II on Securities Fraud Class Certification) (June-July 2014) co-authors: Laurence A. Steckman, Esq., JD, M.Phil. and Robert E. Conner

Class Certification After *Comcast* – Raising the Bar or Changing the Game?, co-authors: Laurence A. Steckman, Esq. and Robert E. Conner, *Private Securities Litigation Reform Act*, Vol. 35, Nos. 1 & 2, at 18 (April-May, 2013), reprinted in modified form, Market Impact, Loss Causation and Multiple Regression Modeling – the Importance of Modular Theories of Damage Causation in Antitrust Class Certification Motion Practice after Comcast v. Behrend, 30 Touro L. Rev. 127 (February 2014)

Education & Licenses

MS, Operations Research, Northeastern University, Boston, MA 1998
BS, Applied Statistics, Rochester Institute of Technology, Rochester, NY 1995
FINRA Series 3, 7, 66 (2005-2012, 2014-2019)
Chartered Financial Analyst (CFA) (2002- Present)

Military Service

US Air Force, Captain, Hanscom AFB, MA (1995 – 2000)

Volunteer Service

Lead Researcher, Cranford 86 Hometown Heroes Project
Year-round tribute to fallen military members from Cranford, NJ. Conduct extensive military and genealogical research about local service members who never returned from war. Drive content for periodic biography and narrative for publication on Cranford86.org and in local newspapers. Project is recipient of the 2019 Unity Achievement Award in Union County, NJ.