

EB-2024-0063

**Generic Proceeding on
Cost of Capital and Other Matters**

TFG/Minogi Compendium for Nexus Economics

October 1, 2024

Tab 1

Ralph Zarumba

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Ralph Zarumba is a regulatory economist with thirty-nine years of experience. He has worked in fifteen countries, assisting utilities, regulators, customer groups, developers, and other industry participants. He has appeared as an expert witness in regulatory and legal proceedings in twenty-four jurisdictions in North America.

REPRESENTATIVE PROJECT EXPERIENCE

Embedded Cost of Service Analysis

- Sponsored an embedded cost of service study and pricing design for CenterPoint Minnesota Natural Gas.
- Sponsored an embedded cost of service study and pricing design for Liberty Utilities New Brunswick natural gas.
- On behalf of Heritage Gas (Nova Scotia), prepared a cost allocation for a natural gas storage field presented before the Nova Scotia Utility and Review Board.
- Mr. Zarumba provided testimony in the proceedings reviewing the 2014 Nova Scotia Power Cost-of-Service study.
- Mr. Zarumba prepared and sponsored a cost-of-service filing supporting a Reliability Must-Run filing on the Cayuga Operating Company before the FERC and the NYPSC.
- Mr. Zarumba provided testimony in the proceedings reviewing the 2014 Nova Scotia Power Cost-of-Service study.

Pricing and Marginal Cost Studies

- On behalf of Enbridge Gas, New Brunswick appeared as an expert witness on marginal cost analysis and its application to pricing in the New Brunswick Power rate request.
- Mr. Zarumba is the principal author and expert witness of an Electric Marginal Cost of Service Study for Montana-Dakota Utilities for their Montana service area.
- On behalf of Bermuda Electric Power Company, prepared a marginal cost of service study, an allocated cost of service study, and a pricing design proposal implementing movement to access charges.
- On behalf of Puerto Rico Electric Power Authority, managed that company's first regulated rate request. It was the witness supporting pricing design, the marginal cost of service, an embedded cost

PROFESSIONAL HISTORY

[Nexus Economics LLC July 2023-present](#)

Founder

[Black & Veatch Global Advisory 2021-June 2023](#)

Practice Leader – Electricity & Natural Gas Regulatory

[Concentric Energy Advisors, Inc. 2016 – 2020](#)

Vice President

[Navigant Consulting 2008-2016](#)

Director

[Science Applications International Corporation 2004-2008](#)

Director

[Zarumba Consulting 2002-2004](#)

President

[Sargent & Lundy Consulting Group 2000-2002](#)

Senior Principal Management Consultant

[Analytical Support Network, Inc. 1997-2000](#)

President

[Synergic Resources Corporation 1996-1997](#)

Manager, Pricing Practice

[San Diego Gas & Electric Company 1994-1996](#)

Senior Analyst

[Wisconsin Electric Power Company 1990-1994](#)

Senior Analyst

[Eastern Utilities Associates 1988-1990](#)

Analyst 4

[Eastern Utilities Associates 1988-1990](#)

Analyst 4

[Illinois Power Company 1985-1988](#)

Analyst

EDUCATION

MA, Economics, DePaul University, 1986

BS, Economics, Illinois State University 1982

of service study, an electric rating period study, proposals for unbundling tariffs into functional components, and detailed testimony addressing compensation for Distributed Energy Resources.

- As an advisor to the Ontario Energy Board assisted in developing a proposal to change electric distribution pricing into a fully fixed tariff design and eliminate the volumetric (i.e., KWH. charge) component.
- Prepared a Pricing Strategy for the South Carolina Public Service Company (Santee Cooper).
- Prepared testimony proposing Retail Conjunctive Billing Pricing filed in Illinois and Wisconsin, filed before the Illinois Commerce Commission and the Wisconsin Public Service Commission.
- Negotiated complex service contracts with thermal energy customers, leading to a major Wisconsin Electric Steam System expansion.
- Prepared ancillary service pricing proposals based on market-based mechanisms for San Diego Gas and Electric Company.
- Prepared an analysis of pricing mechanisms for optional renewable energy products for a Midwestern public power association.

Regulatory Policy

- Prepared a white paper on rate mitigation mechanisms for the Ontario Energy Board.
- On behalf of the Ontario Energy Board, Mr. Zarumba co-authored a study that identified factors that could impede the combination of regulated distributors in that Province.
- On behalf of the Ontario Energy Board, prepared a white paper addressing the apportionment of regulatory commission costs to stakeholders.
- Developed electric regulatory rules for several Southeastern European countries.
- Mr. Zarumba led an effort for the Province of Alberta, which compared the cost of providing distribution services for Rural Electric Associations versus Investor-Owned Utilities.

Generation Market Analysis

- For a major public power generation, the owner prepared a strategy of internal coal versus natural gas generation dispatch protocols, including the treatment of liquidated damages.
- On behalf of Nalcor, I co-authored a report on the feasibility and economics of the proposed development of the Lower Churchill Hydroelectric project.
- Prepared several electric market price forecasts for many regions of the United States and Central America.
- Supported the electric pricing and infrastructure analysis for a Least-Cost Resource Plan for San Diego County.
- Prepared an analysis of coal-fired electric generation technology saturation in the Western Electric Coordinating Council.

- Developed a long-run electric generation expansion plan for the Railbelt System in Alaska used in a Department of Energy Study investigating the feasibility of a natural gas pipeline in Alaska.
- Managed a team that prepared a long-term capacity and energy forecast for a medium-sized municipal utility.
- On behalf of Manitowoc Public Utilities, prepared a resource plan evaluating various generation expansion options.

Large Power Procurement

- During the time period 2004 through 2008, Mr. Zarumba, on behalf of the Metropolitan Transit Authority and the Port Authority of New York and New Jersey, assisted the New York Power Authority (NYPA) in procuring electric generation capacity and energy in RFP 3, RFP 4 and RFP 5. Mr. Zarumba worked with representatives of the City of New York and NYPA, including Mr. Gil Quiniones, who was initially the President of the New York Economic Development Corporation and later the Chief Operating Officer of NYPA. These procurements resulted in contracting for a utility-scale combined-cycle combustion turbine in Queens, a High Voltage Direct Current (HVDC) transmission line between Manhattan and North New Jersey, and various renewables.
- From 1997 through 1999 Mr. Zarumba advised the Build Owners and Managers of Chicago (BOMA/Chicago) on procuring a preferred energy supplier to their membership. BOMA/Chicago estimated their building load (i.e., load excluding tenants) of approximately 700MW. Mr. Zarumba and the BOMA/Chicago team interviewed over one dozen bidders. As a result of the solicitation, a preferred supplier who served BOMA/Chicago for approximately ten years was chosen.
- The Metropolitan Transit Authority operates commuter rail lines that extend into Connecticut, requiring approximately 45MW of load. From 2004 through 2008, he developed a procurement process that provided significant savings for generation services.
- In 2006, Mr. Zarumba was jointly retained by the Chicago Transit Authority and Metra for their first retail power procurement. Mr. Zarumba developed Request for Proposal documents, reviewed legal agreements, and designed the proposal evaluation processes.

Electric Transmission

- Presented testimony before the Alberta Energy Regulator applying marginal cost theory developing a proposed electric transmission tariff.
- Assisted the Long Island Power Authority in purchasing distribution, transmission, and regulatory assets and prepared that utility's non-jurisdictional open-access transmission tariff.
- Prepared the pricing portion of a FERC open access tariff (Docket No. ER96-96-43.000) for San Diego Gas and Electric Company; testified on revenue requirements and pricing, including opportunity costs.
- Prepared a Reliability Must-Run for the Cuyahoga Generating Station, filed with the Federal Energy Regulatory Commission and the New York Public Service Commission.

Revenue Requirements

- On behalf of FirstEnergy, I prepared a Time Study that quantified the capitalization of Administrative and General Expenses. The study was prepared in response to a request from the Federal Energy Regulatory Commission.
- Prepared several Cash Working Capital studies for various distributors and transmitters in the Province of Ontario filed before the Ontario Energy Board.
- For a confidential client, prepared a benchmarking analysis of the costs of regulatory proceedings associated with introducing new electric generation.
- Managed a project for Commonwealth Edison Company in their Electric Rate Request (Illinois Commerce Commission Docket No. 10-467) in which a Cash Working Capital study was provided.
- Assisted Indianapolis Power & Light in preparing a cost recovery plan for Energy Efficiency and Demand Side Management Expenditures.
- On behalf of the Missouri River Electric Cooperative, I managed a project team that completed a Remaining Life Study for the Western Minnesota Municipal Power Agency.
- For Heritage Gas (Nova Scotia) prepared a cost allocation for a natural gas storage field presented before the Nova Scotia Utility and Review Board.
- On behalf of the Ontario Energy Board, prepared a white paper addressing the apportionment of regulatory commission costs to stakeholders.
- Prepared ancillary service pricing proposals based on market-based mechanisms for San Diego Gas and Electric Company.

Valuations and Estimation of Damages

- On behalf of the Government of the Province of Newfoundland, prepared a valuation of certain hydroelectric generating units expropriated by the Province after the closure of the Abitibi Pulp and Paper Mill.
- Mr. Zarumba has prepared several studies preparing valuations of specific generating assets facing market-based pricing in North America.
- As a contractor to NERA Economics assisted in preparing a study quantifying the damages associated with an accident at the Hawthorne Generating Station.

Management Audit and Affiliate Code of Conduct

- Led the regulatory and financial review for a management audit of Jersey Central Power & Light on behalf of the New Jersey Board of Public Utilities.
- On behalf of a coalition of marketers and energy service companies, Mr. Zarumba presented testimony before the Illinois Commerce Commission addressing affiliate rules and code of conduct.

- Mr. Zarumba presented testimony before the Wisconsin Public Service Commission addressing affiliate rules and code of conduct on behalf of a coalition of marketers and energy service companies.

Demand Response

- Assisted the Building Owners and Managers of Chicago (BOMA/Chicago) in developing a program where they can bid demand response based ancillary services into the PJM market.
- Prepared a presentation for the Public Utilities Commission of Ohio on Commercial and Industrial Dynamic Pricing and Demand Response in an unregulated regulatory environment.

Merger, Acquisition, and Divestiture

- On behalf of the Minnesota Public Service Commission. Mr. Zarumba co-authored an analysis of the merger savings associated with the proposed Primergy Merger (the proposed combination of Northern States Power and Wisconsin Energy). The analysis included a detailed review of cost savings emanating from the merger and regulatory commitments made by the companies to regulatory authorities in Minnesota.
- For Manitowoc Public Utilities, an analysis evaluating the divestiture of its transmission assets to the American Transmission Company.

International

- Assisted the Israel Public Utility Authority with electric tariff reviews for the Israel Electric Company and the Jerusalem District Electric Company.
- During the time period 2007 through 2017, assisted the Albanian Electric Regulator in several rate requests, trained staff, and conducted negotiations involving the privatization of the electric distribution system.
- Mr. Zarumba assisted the electric regulator in the Republic of Macedonia with various regulatory issues, including pricing design, revenue requirements, and privatization issues. Included in the assistance was the development of market designs for the electricity sector.
- I completed a tariff implementation plan proposal for privatizing the Bulgarian Electric Utility's distribution companies.
- Led a team to implement regulatory procedures and methodology for the electric power industry in Bosnia and Herzegovina.
- Conducted a of the electric power market in El Salvador, including a quantification of the level of generation market power using the Lerner Index.

EXPERT WITNESS TESTIMONY

SPONSOR	DATE	CASE/APPLICANT	DOCKET/CASE NO.	SUBJECT
Alberta Utilities Commission				
ATCO Electric Ltd.	3/2022	ATCO Electric Ltd.	26911	Transmission Pricing
Federal Energy Regulatory Commission				
Cayuga Generating Company	11/2012	Cayuga Generating Company	ER-13-405-000	Reliability Must-Run Tariff Cost of Service Support
San Diego Gas and Electric Company	09/1995	San Diego Gas and Electric Company	ER96-43	Open-Access Transmission Tariff Filing – Calculation of Transmission Charges
Bermuda Regulatory Authority				
Bermuda Electric Light Company	4/2019	Bermuda Electric Light Company	Not Applicable	Request for a rate increase and multi-year rate plan
Bermuda Electric Light Company	8/2019	Bermuda Electric Light Company	Not Applicable	Marginal Cost of Service Study

British Columbia Utility Commission				
Fortis British Columbia	4/2024	Fortis British Columbia	2027 Rate Setting Framework	Incentive Ratemaking
State of Florida Pilotage Rate Review Committee				
Tampa Bay Pilots Association	7/2024	Tampa Bay	23-3937	Comparison of Tariffs Charged and Compensation Paid in Ports Comparable to Tampa Bay
Illinois Commerce Commission				
Commonwealth Edison Company	5/2022	Commonwealth Edison Company	22-0067	Cost Benefit Analysis
The Building Owners and Managers Association of Chicago	2/2008	Commonwealth Edison Company	07-0566	Commonwealth Edison Company General Rate Case
The Building Owners and Managers Association of Chicago	11/2007	Commonwealth Edison Company	07-0540	Evaluation of an Energy Efficiency Plan for Commonwealth Edison Company
The National Association of Energy Service Companies and Blackhawk Energy Services	02/1999	Commonwealth Edison Company, et al.	98-0147 & 98-0148	Functional Separation of Electric Utility Functions
The Building Owners and Managers Association of Chicago	11/1998	Commonwealth Edison Company, et al.	98-0650	Customer Selection Proceeding – Lottery Rules

The Building Owners and Managers of Chicago, Johnson Controls, Inc., and Blackhawk Energy Services	07/1998	Commonwealth Edison Company	98-0362	Application of Commonwealth Edison to Approve Rate HEP – a Real Time Pricing Tariff
The Building Owners and Managers Association of Chicago	02/1997	Commonwealth Edison Company	96-0485	Complaint against Commonwealth Edison Company's Conjunctive Billing Tariff
Indiana Utility Regulatory Commission				
CenterPoint Indiana	5/2022	CenterPoint Indiana	45722	Securitization
AES Indiana	10/2022	A.E.S. Indiana	38703	Prudency
Kansas Corporation Commission				
Tyson's Fresh Meats	04/2014	Tyson's Fresh Meats	14-WHLW-218-RTS	Abrogation of a Long-term Service Agreement by a Utility
McHenry County, IL				
Indeck Pleasant Valley, LLC.	09/2002	Indeck Pleasant Valley, LLC		Deposition
Lake County, IL				
Indeck Pleasant Valley, LLC.	09/2002	Indeck Pleasant Valley, LLC.		Deposition
Libertyville, IL Zoning Board				

Indeck Libertyville, LLC	01/2000	Indeck Libertyville, LLC		Need for a combustion turbine facility.
Louisiana Pilotage Fee Commission				
Crescent River Port Pilots' Association	7/2020	Crescent River Port Pilots' Association	P20-001	Benchmarking analysis of pilotage fees

Massachusetts Department of Public Utilities				
Eastern Edison Company	04/1990	Eastern Edison Company		Purchased Power Cost Adjustment Calculation
Eastern Edison Company	02/1990	Eastern Edison Company	90-9A	Oil Conservation Adjustment Calculation
Eastern Edison Company	02/1990	Eastern Edison Company	90-4A	Fuel Cost Adjustment Calculation
Eastern Edison Company	12/1989	Eastern Edison Company	89-240	Purchased Power Cost Adjustment Calculation
Eastern Edison Company	11/1989	Eastern Edison Company	89-4D	Fuel Cost Adjustment Calculation
Eastern Edison Company	05/1989	Eastern Edison Company	89-9D	Oil Conservation Adjustment Calculation
Eastern Edison Company	08/1989	Eastern Edison Company	89-9B	Fuel Cost Adjustment Calculation
Eastern Edison Company	08/1989	Eastern Edison Company	89-9C	Oil Conservation Adjustment Calculation
Eastern Edison Company	05/1989	Eastern Edison Company	89-4B	Fuel Cost Adjustment Calculation
Eastern Edison Company	11/1989	Eastern Edison Company	89-9B	Oil Conservation Adjustment Calculation
Eastern Edison Company	05/1989	Eastern Edison Company		Conservation Surcharge Adjustment
Eastern Edison Company	02/1989	Eastern Edison Company	89-4A	Fuel Cost Adjustment Calculation
Eastern Edison Company	02/1989	Eastern Edison Company	89-9A	Oil Conservation Adjustment Calculation
Eastern Edison Company	11/1988	Eastern Edison Company	88-4D	Fuel Cost Adjustment Calculation

Eastern Edison Company	11/1988	Eastern Edison Company	89-4D	Oil Conservation Adjustment Calculation
Eastern Edison Company	05/1988	Eastern Edison Company		Conservation Service Charge
McHenry Country, IL Zoning Board of Appeals				
Indeck Pleasant Valley, LLC	03/1999	Indeck Pleasant Valley, LLC	99-04	Need for a combustion turbine facility
Minnesota Public Utilities Commission				
CenterPoint Energy Minnesota Gas	11/2021	CenterPoint Energy Minnesota Gas	G-008/GR-21-436	Class Cost of Service and Rate Design
Montana Public Service Commission				
Montana Dakota Utilities	9/28/2018	Montana Dakota Utilities	D2018.9.60	Marginal Cost of Service Study
New Brunswick Energy and Utility Board				
Enbridge Gas New Brunswick	12/2016	NB Power Company	Matter 357	Marginal Cost Pricing
Liberty Utility New Brunswick	12/2019	NB Power	Matter 458	Marginal Cost Pricing
Liberty Utilities New Brunswick	11/2021	Liberty Utilities New Brunswick	Matter 494	Natural Gas Allocated Cost of Service and Pricing Design

New Jersey Board of Public Utilities				
Public Service Electric & Gas Company	11/2021	Public Service Electric & Gas	EO21111211 / GO21111212	Cost-Benefit Analysis for Infrastructure Investments
New Mexico Public Regulation Commission				
El Paso Electric Company	07/2015	El Paso Electric Company	15-000127-UT	Cash Working Capital Study
New York Public Service Commission				
Cayuga Generating Company	11/2012	Cayuga Generating Company	12-E-0400	Reliability Must-Run Tariff Cost of Service Support
Nova Scotia Utility and Review Board				
Heritage Gas	12/2014	Heritage Gas	M06582	Allocated Cost of Service Analysis
Port Hawkesbury Paper	10/2013	Port Hawkesbury Paper	P-892/M05473	Allocated Cost-of-Service

Ontario Energy Board				
Hydro One Networks Inc. (transmission)	05/2016	Hydro One Networks Inc. (transmission)	EB-2016-0160	Cash Working Capital Studies
Entegrus Powerlines Inc.	12/2015	Entegrus Powerlines Inc.	EB-2015-0061	Cash Working Capital Study
Hydro Ottawa	10/2015	Hydro Ottawa	EB-2015-0004	Cash Working Capital Study
Kingston Hydro	09/2015	Kingston Hydro	EB-2015-0083	Cash Working Capital Study
North Bay Hydro	07/2015	North Bay Hydro	EB-2014-0099	Cash Working Capital Study
Toronto Hydroelectric System Limited	06/2014	Toronto Hydroelectric System Limited	EB-2014-0116	Cash Working Capital Study
Horizon Utilities	03/2014	Horizon Utilities	EB-2014-0002	Cash Working Capital Study
APPrO	02/2013	APPrO	EB-2012-0337	Recovery of Energy Efficiency Costs from Electric Generators
Great Lakes Power Transmission	07/2012	Great Lakes Power Transmission	EB-2012-0300	Corporate Shared Services Study
London Hydro	07/2012	London Hydro	EB-2012-146	Determination of Working Capital Requirements
London Hydro	07/2012	London Hydro	EB-2012-146	Cost Allocation of Revenue Cycle Services
Hydro One	08/2012	Hydro One	EB-2012-0031	Cash Working Capital Studies
Hydro One Networks Inc. (distribution)	12/2013	Hydro One Networks Inc. (distribution)	EB-2013-0416	Cash Working Capital Study
Ontario Energy Board	01/2012	Ontario Energy Board	EB-2012-0018	Review of the Ontario Energy Board

				Cost Assessment Model
Ontario Energy Board	11/2011	Ontario Energy Board	EB-2010-0378	Principal Author of Rate Mitigation White Paper
Public Hearings Held on Long Island				
Long Island Power Authority	05/1998	Long Island Power Authority		Non-Jurisdictional Open-Access Transmission Tariff
Puerto Rico Energy Commission				
Puerto Rico Electric Power Authority	05/16	Puerto Rico Electric Power Authority	CEPR-AP-2015-0001	PREPA General Rate Case: Pricing Design; Embedded Cost of Service; Marginal Cost of Service; and Provisional (Temporary) Rate
Puerto Rico Electric Power Authority	04/16	Puerto Rico Electric Power Authority	CEPR-AP-2016-0001	Pricing Design and Cost Recovery Mechanism for Transition Charges

Rhode Island Public Utilities Commission				
Blackstone Valley Electric Company	02/1989 06/1989 02/1990	Blackstone Valley Electric Company	1541	Fuel Adjustment Clause Calculation
Blackstone Valley Electric Company	02/1989 06/1989 02/1990	Blackstone Valley Electric Company	1856	Purchased Power Cost Adjustment Calculation
Blackstone Valley Electric Company	02/1989 06/1989 02/1990	Blackstone Valley Electric Company	1694	Oil Conservation Adjustment Calculation
Texas Public Utilities Commission				
El Paso Electric Company	08/2015	El Paso Electric Company	15-00127-UT	Cash Working Capital Study
Wisconsin Public Service Commission				
Johnson Controls, Inc., Harley-Davidson, and WICOR Energy	01/1998	Johnson Controls, Inc., Harley-Davidson, and WICOR Energy	6630-UR-110	Application of Wisconsin Electric Power Company for a Rate Increase for Electric, Gas, and Steam Service
National Association of Energy Service Companies	1/1999	Wisconsin Public Service Commission	05-BU-101	Affiliates Relations Rules

Tab 2

Francis X. (Frank) Pampush, PhD, CFA

Executive Advisor to Nexus Economics

frank@pampush.net
Atlanta, GA 3019
Cell: 404-840-8410

Professional Summary

Dr. Francis X. (Frank) Pampush provides expert analysis, economic and financial studies, and models that are used to address complex business decisions and disputes. Dr. Pampush has deep experience in the analysis of network industries such as communications / Internet, electricity production / transmission / distribution, and oil and gas pipelines. He has provided consultation services to power utilities and resource firms in both regulated and non-regulated businesses.

Dr. Pampush's specialties are economic valuations, damages assessments, cost of capital, and data analytics. He has developed or managed the development of discounted cash flow valuation models and damages analyses for the oil exploration and production industry in Latin America, the telecommunications equipment and services industries in the U.S. and Japan, the U.S. wholesale electric power market, and beverage bottling industries in Latin America. He has statistically analyzed credit rating determinants for investor-owned and public power corporations. He has provided expert reports and/or testimony on cost of capital, discount rates, and country risk before the Federal Energy Regulatory Commission (FERC), the Regulatory Authority of Bermuda, the Puerto Rico Energy Commission, and the to Israel Electric Corporation. He has served as the expert in wholesale electric power contract price negotiations and for cost of capital. Dr. Pampush managed a multi-billion-dollar oil pipeline expropriation damages case with economics teams located on three continents. The case was arbitrated at the International Center for the Settlement of Investment Disputes (ICSID) in The Hague.

Representative Matters

Power Utilities and Natural Resources

Bermuda Electric Light Company (BELCO). Provided written expert testimony (report) regarding utility cost of capital. (December 2018 – date). Update reports submitted 2020 and 2021.

Fortis Inc. Provide expert analysis and discussion (in a larger white paper with multiple authors) regarding country risk as a factor in rate-of-return results. (November 2018 – April, 2019)

Nicor. Analyze cost of equity in anticipation of litigation and provided report to client. (June 2018 – October 2018)

Jamaica Public Service Company. Provided research and analysis on cost of capital and country risk to JPS senior management and to the Jamaica Office of Utility Regulation (OUR) in Kingston in anticipation of a cost-of-service rate case. (December 2017 – June 2018)

Puerto Rico Electrical Services Provider. Analyzed bond rating data regarding key credit metrics. Provided cost of equity. Analyzed revenue requirements. (Report submitted May 2016. Testimony in Puerto Rico in December 2016). (November 2015-January 2017).

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Nicor Gas. Managed case and provide analysis of profitability of certain home warranty services. (2014-2016).

Crop Science & Pharmaceutical Company. Managerial and consultative (non-testifying) role in the evaluation of cost of capital and interest rate for a FIFRA Section 3(c)(1)(F) arbitration. March 2013 – December, 2014 (and separate case beginning December 2015). (Case settled.)

Israeli Electric Corporation. Consultative role regarding cost of equity capital and capital structure. November 2013 – December 2014. Report submitted to regulatory authority.

ConocoPhillips. Directed staff on three continents to compute \$22 billion dollar damages related to expropriated assets. Case was arbitrated at ICSID in The Hague. (ICSID Case No. ARB/07/30) Damages computation included risk-adjusted cost of capital. March 2007 – June 2010. (ICSID ruled the takings to be unlawful September 2013. ICSID declined to revisit its ruling February 2016.) (2007-2012)

U.S. IOU Electric Service Provider. Managed case related to the development of cost of capital estimates for a state regulatory cost-of-service rate case. November-December 2012. (Case settled before report submitted.)

Integrated Oil Producer. Provided research and analysis regarding the effects of tax policy on asset value. November 2008 – May 2009. (Non-litigation consulting.)

Electric and Gas Utilities. Directed research and analysis related to proposed rights-of-way laws. August - September, 2006. (Non-litigation consulting.)

International Energy and Resources Firm. Directed damages quantification in dispute between forestry product and oil/natural gas producer in Argentina in U.S. Federal Court. June 2005 – 2006. (Case settled.)

Coop and Muni Wholesale Electric Customers. Expert affidavit on cost-of-capital, capital structure, cost-of-service, and nuclear decommissioning fund funding, filed on behalf of Wholesale Electric Customers at the FERC, 1991.

Communications & Information Technology

Wireless Services Provider. Analyzed data regarding alleged avoided costs in support of expert report. (January-February 2016).

AT&T Inc. Computed damages related to alleged trespass of fiber cable of cell towers. (2014). (Case settled.)

Sprint Corp. Directed damages analyses regarding alleged patent infringements in cases in various federal district courts. June 2013-2015.

Consolidated Communications. Provided economic model responding to an alleged \$127 million damages case regarding competitive entry of an Internet Service Provider. March 2012 - November 2013. (Case settled.)

AT&T Inc. Directed damages analysis in multiple cases alleging intrastate access charge avoidance by prepaid calling card providers. Multiple U.S. district courts. March 2011 to 2012. (Cases settled.)

Satellite TV Provider. Directed analysis of damages in a class action lawsuit that alleged deceptive leasing terms of set-top boxes. January 2011 to May 2011. (Case dismissed.)

Search Engine Firm. Determined value of Japanese Internet search engine assets. November-December 2009. (Non-litigation consulting.)

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U.S. Telecommunications Services Provider. Directed rebuttal analysis regarding alleged anticompetitive actions by service providers' when implementing the FCC's Universal Service program. March 2007 – December 2008.

Bell Canada. Directed staff research in a national regulatory case in Canada related to proposed price regulations. 2006 - 2008.

U.S. Telecommunications Services Provider. Directed competitive assessment of the domestic long-haul backbone telecommunications services industry during the 1996-2001 period for a state regulatory case. March 2006 – 2008.

U.S. Telecommunications Services Provider. Directed a competitive analysis for expert's report to FTC and FCC regarding a proposed merger of U.S. telecom service providers. February 2006 – 2007.

U.S. Wireless Affiliate Services Providers. Directed research and damages analysis in a dispute between a wireless services provider and its affiliates regarding alleged breach of exclusivity provisions of the affiliate agreements. September 2005 - 2007. (Settled via acquisition of affiliates for a premium.)

U.S. Telecommunications Services Provider. Developed a financial model for use by expert to determine a reasonable supersedeas bond amount. August 2005.

Puerto Rico Telephone Company, Inc. Directed damages analysis in a dispute over carrier compensation in the Puerto Rico payphone industry. October 2004.

U.S. Telecommunications Services Provider. Directed a competitive analysis for expert's report to FTC and FCC regarding a proposed merger of U.S. telecom service providers. February 2006 – 2007.

U.S. Telecommunications Services Provider. Directed competitive analysis for expert's report to the FTC and FCC regarding a proposed merger of U.S. telecom service providers. February 2005 - 2006.

U.S. Telecommunications Services Provider. Directed multiple cases that assessed competition during regulatory reclassification proceedings before various state regulators. Separate cases for a client in early 2004, Aug 2004-Mar 2005, Jan-Aug 2005, and July - Sep 2005.

Italian Telecommunications Services Provider. Directed analysis regarding the potential economic benefits of integrating landline and mobile service providers in Brazil. June – November, 2004. (Non-litigation consulting.)

U.S. Telecommunications Services Provider. Directed cases and modeling in multi-state regulatory proceedings regarding the implementation of the FCC's Triennial Review Order. May 2003 - April 2004.

U.S. Telecommunications Services Provider. Directed research regarding interconnection agreements between carriers in multiple regulatory proceedings in Texas, California, Michigan, Illinois, and Indiana. 2003 - 2004.

Telecommunications Equipment Manufacturers. Directed research developed studies and presentations for expert's use before the U.S. Department of Justice in the evaluation of the merger of two communications equipment manufacturers. July 2002.

U.S. Telecommunications Services Provider. Directed research and analysis for the potential of affiliated Bell Companies to dominate the long-distance service business. October 2001. (Non-litigation consulting.)

Telecom Equipment Manufacturer. Global industry study, outlook, and forecast provided to a major telecom equipment manufacturer. February 2001. (Non-litigation consulting.)

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U.S. Telecommunications Services Provider. Directed research and analysis regarding the economically-efficient application of the 1996 Telecommunications Act's unbundling requirements. Before a state regulatory authority. 2001.

Ameritech, Inc. Directed regulatory review case before the Illinois Commerce Commission. Work included coordinating multiple experts; managing docket process; assisting expert in writing testimony. 2001.

Mexican Telecommunications Services Provider. Provided an analysis of worldwide access and interconnection prices. December 2000. (Non-litigation consulting.)

U.S. Telecommunications Services Provider. Provided report on the state of competition in the residential, small, medium, and large business segments by landline, wireless, and data/Internet technologies. November 2000. (Non-litigation consulting.)

Global Telecommunications Equipment Manufacturer. Directed research and analysis regarding the application of game theory principles to corporate strategy and planning. August 2000. (Non-litigation consulting.)

Banking & Finance

Money Center Bank. Provided statistical analysis support to expert regarding mortgage default rates by type of mortgage. (February-March 2015).

Investment Bank. Research and analysis supporting expert report regarding the ultra-long-haul telecommunications industry during the 1990s and '00s. Evaluated prudence of a proposed merger and secondary stock offering. November 2006 – December 2008. (Case settled.)

Other Industries

Radiology Professional Association. Directed research and analysis in support of expert damages claim related to allegations of anticompetitive conduct of radiologists in a U.S. metropolitan area. District Court – KS. August 2013 – 2015.

Global Manufacturer of Diesel Engines. Directed staff research and analysis regarding alleged damages related to fast-ferry marine engine performance. Alaska state court. October – November 2012. (Case settled. Report not filed.)

PepsiCo Inc. Managed case responding to alleged \$525 million in damages regarding bottling assets in Peru. U.S. Federal Court of NY. 2008 - June, 2009. (Opposing expert report excluded as a result of filed responsive expert report. Case dismissed.)

Private Individual. Analysis and expert report regarding damages resulting from alleged voter interference and phone jamming in a 2002 national election in New Hampshire. 2006. (Report not filed; no deposition.)

Papers Filed with Public Agencies

BELCO Cost of Capital (with Julie Lieberman and Isabella Beerli). Filed with the Regulatory Authority of Bermuda, April 19, 2019.

Presentation to Jamaica's Office of Utility Regulation (OUR) regarding Jamaica Power Company's cost of capital and country risk. Filed December, 2017.

Expert Testimony of Francis X. Pampush, Lucas D. Porter, and Dan T. Stathos, Commonwealth of Puerto Rico, Puerto Rico Energy Commission, In Re: The Puerto Rico Electric Power Authority: Initial Rate Review, No. CEPR-AP-2015-0001, May 27, 2016.

Expert affidavit filed on behalf of Ameritech filed with the FCC in the matter of Advanced Telecommunications Capabilities (CC Docket 98-147), 1999.

Expert affidavit filed on behalf of SBC and Ameritech with the U.S. Department of Justice on the Matter of the SBC/Ameritech Merger, 1998.

Expert affidavit filed on behalf of Ameritech filed with the FCC in the matter of bundling of terminal equipment with Advanced Services, 1998.

Cellular Interconnection Policies and Rates: An International Perspective, white paper filed with the Spanish Ministry of Communications, April 21, 1994.

Expert affidavit filed on behalf of a large telecommunications carrier with the Brazilian Ministry of Transport and Communications on an Alternative Incentive Regulation plan to be applied to cellular licensees, September 1992.

Publications, Conferences and Working Papers

"How Blockchain Works," white paper presentation (and working blockchain code), June 2018.

"The Effect of the 2018 Tax Cut & Jobs Act on Utility Cost of Capital," white paper and presentation provided to utility analysts and lawyers in a Concentric Energy small group work sessions. February, 2018.

"Validity and Precision in Statistical Samples in Legal Cases," American Bar Association -- Expert Witness Journal, July, 2016.

"Defensive Acquisition and Dispute Resolution Related to the Web's New Generic Top-Level Domain Names," working paper, November, 2013.

"Social-Welfare Implications of Liability Rules in Major Damages Cases," American Bar Association – Environmental Litigation, Fall 2011, Vol. 23, No. 1. (With Debra Aron.)

"Trends in Telecommunications Demand and Supply." Presentation to the 47th Annual NARUC Regulatory Studies Program, Michigan State University Institute of Public Utilities, August 2005.

"State Commissions Systematically Have Set UNE Prices Below Their Actual Costs," with Debra J. Aron and E. Gerry Keith. Presented at the May 2004 Spring Conference of the Center for Research in Regulated Industries.

"State Commissions Systematically Have Set UNE Prices Below Their Actual Costs," with Debra J. Aron and E. Gerry Keith. White Paper, November 2003.

"Balancing Concerns of Price Squeeze and Pricing Flexibility in the U.S. Telecommunications Industry," working paper with Debra J. Aron. March 2002.

"Six Factors Contributing to the Decline and Consolidation of CLECs in the U.S.," working paper with Debra J. Aron. March 2002.

"Telecommunications Competition: A Fresh Perspective," Presentation and panel discussion, Southeast Association of Regulated Utility Commissioners. June 2001.

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"The Telecommunications Industry in Ohio." Presented to a state senator and staff in anticipation of state legislation. December 1999.

"The Impact of Unbundling and the Internet on the Telecommunications Access Infrastructure," presentation at the Consortium on Telecommunications Regulation and Policy, Michigan State University, 1998.

"Worldwide Wait? How the Telecom Act's Unbundling Requirements Slow the Development of the Network Infrastructure," with Debra Aron and Ken Dunmore, *Industrial and Corporate Change*, vol. 7, no. 4, 1998, pp. 615-621.

"The Impact of Unbundled Network Elements and the Internet on Telecommunications Access Infrastructure," presentation at the Harvard Information Infrastructure Project Impact of the Internet on Communications Policy, December 1997.

Fundamentals of Power Forecasting I and II working paper to the Tennessee Valley Public Power Authority R&D Committee, 1995 and 1996.

Review of article on the Japanese Stock Market for the International Society of Financial Analysts, Vol. 8, No. 1, Winter 1996, pp. 9-11.

"Cellular Interconnection Policies and Rates: An International Perspective," commissioned study, April 21, 1994.

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Work History

Executive Advisor, Nexus Economics (April 2024 - date)
Executive Advisor, Concentric Energy Advisors (Jan 2017- date)
Assistant Professor Finance & Analytics – Oglethorpe University (Fall 2017-Spring 2021)
Director, Navigant Consulting (2010-2016)
Senior Managing Economist, LECG, LLC (2000-2010)
Director, Ameritech (1996-2000)
Economist, Southern Engineering Co. (1991-1996)
Manager, BellSouth (1982-1991)

Professional Associations

Chartered Financial Analyst® designation, 1993. (Charter number 18753).
CFA Society of Atlanta
Atlanta Economics Club (past President)
American Bar Association – Associate (former)

Skills

Advanced Data Analytics, Econometrics, Financial Analysis, Cost-of-Equity and Cost of Capital, Microeconomics, Utility (and monopoly) pricing, Analysis of Cross-Subsidization, Damages Analysis. Proficient in R.

Education

PhD, Economics	University of North Carolina, Chapel Hill, North Carolina
BA, Economics	Miami University, Oxford Ohio