

**Richard Caldwell** is a Principal who has been with The Brattle Group for over 15 years. Richard is an economics and financial expert, with experience valuing businesses and financial instruments across a range of industries, from mining to banking to telecoms, and in a range of settings. He routinely provides economic and financial advice concerning the areas of corporate finance and valuation, the pricing of securities and derivatives, and assessments of competition and regulatory issues.

Richard has testified before the UK Competition Appeals Tribunal on the level of returns for network companies, and testified on damages and financial issues in over twenty international arbitrations. He has testified before tribunals set up under the rules of the Energy Charter Treaty, the London Court of International Arbitration (“LCIA”), the International Centre for Settlement of Investment Disputes (“ICSID”), UNCITRAL, Dutch Law and Swiss Law. Richard has worked on behalf of both claimants and respondents.

Richard is currently retained as an expert witness by international investors in sixteen ongoing ICSID cases against the Kingdom of Spain claiming damages arising from the changes in Spanish energy renewables regulations. As part of that work he has analysed the financing structure of renewables investments including project finance loans and interest rate swap (IRS) contracts, and assessed Spanish regulatory risks. He is also currently retained as an expert witness in arbitrations concerning the retroactive conversion of foreign exchange loans and the failure of Eastern European State to address illegal activity in a consumer market.

Richard regularly teaches a core corporate finance and valuation course on the Masters in Finance program at the London Business School. Richard has degrees in Engineering from Cambridge University.

## EXPERIENCE

### Expert Testimony

- **Change in Renewable Tariff Regime** –For numerous investors in solar PV, concentrated solar power and wind, provided expert testimony in eighteen separate ICSID proceedings concerning the financial impact of a mid-stream switch in the regulatory regime for Spanish renewables. The analysis considers both the reduction in remuneration plus side effects, such a need for debt restructurings, guarantee payments and planned refinancing.
- **Expropriation of Oil Exploration License** - For a European government, provided expert testimony in an UNCITRAL arbitration concerning the value of a license to explore an onshore oil block. The analysis involved an examination of geotechnical research, analogous blocks, a valuation analysis performed in the normal course of business, and the performance of the stock price of the claimant.
- **Tax Regime Modification and Expropriation of Oil Assets** – For the Ecuadorian government, provided expert testimony in an ICSID arbitration concerning the

reasonableness and economic impact of a modification in the hydrocarbon tax regime. Used futures and options prices to illustrate market expectations at different points in time and to demonstrate both the extent of the unanticipated rise in oil prices and that an expectation of additional taxes in response to unanticipated price changes would not have seriously impacted the original contractual bargain. Also provided testimony concerning the financial impact of the change in tax regime on the claimant, an operator of two large blocks containing numerous oil fields. Richard's testimony involved the valuation of each of the fields in the two blocks at different points in time, based on different taxation and production assumptions.

- **Damages due to an Unreasonable Fine** – For the Polish government, provided joint expert testimony in an ECT arbitration concerning the economic impact of the imposition of a fine on an oil trading company. Used financial techniques drawn from the valuation of futures and options to derive an estimate of damages.
- **Value of Gas to Liquids Plant** – For a start-up company, provided expert testimony in an LCIA arbitration concerning the value of its equity share in a 90% complete gas-to-liquids plant. The testimony involved the valuation of a set of non-standard American options. The valuation required the use of binomial tree and simulation techniques to assess the value of the options.
- **Damages to Car Parts Designer** – For a car parts designer, provided expert testimony concerning the economic harm due to a breach of a license contract by a large manufacturer. Used financial techniques to distinguish between the risk attached to the royalty stream due to the designer and the profit stream enjoyed by the manufacturer. Also analysed the impact of project de-risking between the initial R&D phase and subsequent manufacturing.
- **Damages for Breach of Medical Device Supply Warranties** – For a European distributor, provided expert testimony on damages due to the supply of a sub-standard product by a manufacturer. The analysis required a forecast of market potential, likely market shares and selling prices, the construction of a detailed financial model and the quantification of several areas of consequential harm.
- **Expropriation of Steel Mill** – For a private equity fund, provided expert testimony concerning the value of a steel mill in Eastern Europe in an ICSID arbitration. The analysis considered the impact of delays in the delivery and installation of key production equipment and the impact of labour disputes. The valuation involved forecasting prices and sales quantities for a range of commodity and quality steel products, and ultimately assessing the fair market value of the investment interests of the private equity fund.

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- **Value of Steel Agency** – For a major steel company, provided expert testimony concerning the value of a steel trading business in Western Europe. The analysis considered the potential sales of the trading business and the financial incentives of trader’s contractual suppliers to expand production and sales in the relevant territories.
- **Damages due to Unfair Competition** – For a producer of alcoholic drinks, provided expert testimony in an ICSID arbitration estimating the financial impact of the rise in excise taxes and a failure of an Eastern European government to curtail the production of illicit alcohol. The analysis involved assessing the production costs of different types of alcoholic drinks producers, the extent of tax evasion and the impact of the illicit alcohol sales on the pricing and sales volumes of licit producers.
- **Analysis of Bank Fraud** - For a South East Asian government, provided expert testimony concerning the size and scope of a bank fraud in an international arbitration. Analysed numerous complicated transactions involving the transfer and sale of bespoke convertible securities. Also assessed the value of an investor's equity interest in the bank and the value of a convertible debt issue.
- **Value of Copper Concentrate Trading Business** - For a Georgian commodity trading company, provided expert testimony in a Swiss Law arbitration concerning the economic harm due to a breach of contract by a large multi-national.
- **Value of Car Parking Joint Venture** – For a Spanish infrastructure company, provided expert testimony in an ICC arbitration concerning the value of a joint venture to acquire and manage car parking spaces in Spain.
- **Valuation of Large-cap Bank** – For several investors, provided advice on the relevance and materiality of misstatements and omissions made in a rights issue prospectus during 2008, and the potential damages. Quantified the extent of overstatement of the bank’s share price due to the omissions and misstatements. Proceeded to author a report on potential damages due to the omissions and misstatements.
- **Value of a Mortgage Portfolio** – Provided expert testimony for a large European bank in relation to the value of a foreign currency mortgage portfolio and the impact of a law requiring the retroactive currency redenomination of the mortgages into Euros. Analysis includes an assessment of the mortgage policy options of the host government and the development of a detailed statistical model of default and prepayment.
- **Value of a Bus Network** – Providing expert testimony for investors in a bus transit network in Latin America concerning the financial impact of numerous failures by the

transportation authority, such as in relation to fare evasion, road improvement and network operation.

### Valuation and Corporate Finance

- **Expropriation of Oil Assets** – Estimated damages to ExxonMobil due to the expropriation of a large oil field in Venezuela. The analysis involved a creative approach to country risk, which explicitly assessed the likelihood of supply disruptions due to labour problems and isolated the impact of expropriation risk on valuations. The approach relied on up-to-date political risk research used by the US government to size the Strategic Petroleum Reserve.
- **Financial Impact of Price Caps and Taxes in Argentinian Gas Market** – Estimated damages to an Argentine gas producer arising from government intervention in the gas industry, in terms of both price caps and export restrictions. The analysis assessed the impact of the price caps and export restrictions on investment and production levels, and estimated likely market prices, production, capital and operating costs in their absence.
- **Valuation of an Oil Pipeline** – For the State of Israel, assisted in the provision of an expert report assessing the value of a large oil pipeline company, involved in transporting oil from the Gulf to the Mediterranean. The analysis examined the costs and benefits of different supply options to derive the value associated with pipeline transport.
- **Oil Price Forecasting** – Developed oil price forecasts for numerous clients based on a review of the stock price performance of various royalty trusts, including the BP Prudhoe Bay Royalty Trust. The analysis involved the development of a DCF model for a given royalty trust, which could be used to infer the long-term path of oil prices implicit in prevailing stock prices.
- **Value of Prime Russian Real-Estate Project** – For investors in a large Russia real estate development, assisted in the provision of expert testimony for an LCIA arbitration . The dispute related to an alleged corporate raid. Our analysis examined the evidence and incentives of the relevant parties, assessed whether or not events could be explained rationally, and estimated damages under alternative legal scenarios. Our analysis involved assessing numerous restructuring transactions.
- **Value of Prime Egyptian Real-Estate Project** – For investors in a Cairo real estate development project, estimated the damages due to the government’s failure to register title to the land. Due to provide expert testimony in forthcoming arbitration.

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- **Value of Real Estate Investment Fund** – For the manager of a real estate investment fund, estimated the damages due to a negligent failure by the manager to respect exposure limits. Providing ongoing advice in context of UK court proceedings.
- **Value of Hotel Development Project** – For the developer of a luxury seaside hotel, estimated the extent of damages due to re-zoning and consequent preclusion of ongoing development activities.
- **Value of Construction Contract** – For a construction company, estimated the prospective value of a large contract to complete the construction of a highway. The contract was subject to delay and outright termination.
- **Loss of Reputation** – For a construction company, estimated the financial impact of allegations concerning inappropriate insider dealing and related party transactions. The allegations undermined a large bond issuance and the resulting cash flow difficulties caused project delays and cancellations.
- **Financial Valuation in the Aviation Industry** – Estimated the required return and value of quasi debt/equity funding instrument for R&D in the aviation industry. Prepared a detailed financial model for the UK Treasury to use in valuing specific funding requests, and provided an analysis of potential risks and rewards of development projects at different points in their life-cycle. Developed the lifecycle model from work originally performed by Professor Myers of MIT for the pharmaceutical industry. The model quantified the difference in risks and value between the early stages of development (i.e. R&D) and subsequent manufacturing.
- **Capital Budgeting for Infrastructure Owner** – Advised a multinational corporation about the impact of the credit crisis and developed recommendations for its capital allocation policies. In the context of the credit crisis, provided valuations of the corporation's different business lines, including its substantial holding of UK airport assets. The analysis distinguished the distinct risks faced by different airports and the corresponding impact on valuations. The advice also covered the importance of quantifying real options, such as the option to wait or to expand.
- **Expropriation of Car Parking Business** – For a European company, contributed to expert testimony on damages and designed and built a detailed financial model to estimate damages due to the expropriation of a car parking business. The assessment involved the valuation of a call option written on the shares of the business.
- **Damages Due to Reputational Harm** – For a European government, analysed and drafted testimony in an ICSID arbitration concerning the value of reputational harm from

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criminal investigations into the CEO of a major integrated oil company. The analysis examined the impact of news coverage on the stock price of the oil company.

- **Sale of Credit Card Business** – Contributed to expert testimony concerning damages arising from the aborted sale of a US credit card business. Constructed a detailed financial model of a typical credit card portfolio to benchmark the performance of the credit card portfolio under dispute, and to assess its value at different points in time.
- **Bank Valuation** – For a bank involved in litigation over the sale of their assets, analysed each business unit and provided an estimate of their relative values.
- **Damages due to Tariff Freeze** – For investors in a Latin American electricity distribution company subject to an ICSID arbitration, constructed a detailed financial model to quantify the financial impact of a substantial reduction in allowed tariffs. The financial model formed the basis of their damages claim.
- **Valuation of Television Business** – For a television company involved in litigation over a breach of contract, designed and built a financial model to estimate damages. The financial model relied on detailed estimates of operating costs under different assumptions. Constructed a detailed financial model that accurately predicted the levels of two purchase offers for a car-parking business and that estimated damages due to breach of treaty rights.
- **Impact of Transportation Problems on Coal Mine** – For a US coal company, constructed a detailed financial model to estimate the impact of curtailing production caused by the poor performance of a railroad. Performed a statistical analysis of the costs associated with different levels of production in an attempt to estimate marginal production costs.
- **Impact of Tariff Freeze on Argentinian Gas Distributor** – For a US utility, estimated the damages arising from the abrogation of legal rights in Argentina. Constructed a detailed financial model of the business, incorporating the impact of the economic crisis on gas demand and the exchange rate.
- **Electricity Assets Valuation** – For a separate US utility, analysed the value of electricity generation assets in the Dominican Republic.
- **Economic Analysis of a Lignite Mine and Power Plant Project in Turkey** – For a client involved in arbitration proceedings, helped analyze the economics of a proposed lignite mine and mine mouth power plant in Turkey. Constructed a financial model that estimated the costs of the lignite mine and the potential value of electricity sales. Used standard bond pricing techniques to model the effects of counterparty risk on the value of the power plant.

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- **Valuation of European Pipeline Company** – Advised a large multinational energy company on the reasonableness of the stock price for one of its large shareholdings in Europe. Prepared a report evaluating whether the stock market rewarded energy companies that were vertically integrated across natural gas production and distribution, as opposed to separate “pure play” production and distribution companies.
- **Market Value of Natural Gas** – For an energy company involved in a gas price arbitration, established the appropriate interest rate for estimating the market value of natural gas.
- **Margin Squeeze in Broadband Sector** – For a telecoms company, designed and built a financial model to estimate the damages associated with a margin squeeze in the wholesale broadband market in an EU country. Analysed detailed accounting data and estimating the costs prompted by extra broadband customers.
- **Damages from Change in Regulatory Regime** – For a US utility company, designed and built a financial model to estimate the damages arising from a major change in the regulatory regime in the Dominican Republic.
- **Construction Damages in Pakistan** – For a Turkish construction company, analysed and drafted testimony concerning the harm arising from the cancellation of a major highway construction contract half way through.
- **Assessing Impact of CO2 Costs** – For a European utility company, designed and built a financial model to assess the impact of CO2 costs on financial performance of a large gas-fired power plant.
- **Estimating Investment Rates of Return** – For private clients in Europe, designed and built models that estimated the return that investors require to undertake investments. For example, estimated the returns that investors require on gas pipeline investments from 1968 to the present for a Belgian pipeline company. Used the historical cost of capital estimates to determine the value of the firm’s regulatory asset base. Estimated the cost of capital for a Danish pipeline. Estimated the rate of return required for an electricity interconnector between Norway and the Netherlands.

### Competition and Regulation

- **Airlines** – For the European Commission, helped estimate the economic impact of removing all trade and merger barriers for trans-Atlantic air travel. Analysed the cost savings that could be achieved as a result of consolidation and expansion of airlines after liberalization, modeling potential efficiency improvements in inefficient carriers through acquisitions or increased competitive pressure, and the corresponding impact on consumer and social welfare.

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- **Mobile Call Termination** – Provided testimony on behalf of the UK telecoms regulator, Ofcom, before the Competition Appeals Tribunal concerning the measurement of a reasonable rate of return for mobile network services. The testimony was relevant to an appeal of the level of mobile call termination rates and was cited favorably in the final decision. Routinely advise the UK telecoms, Ofcom, on the level of returns for mobile networks and fixed lines.
- **UK Competition Commission Store Card Inquiry** – Co-authored four reports and provided support at oral hearings before the UK Competition Commission, as part of a major investigation into the store card industry. Our analysis highlighted problems in the Commission's profitability and competitive assessments. We developed our own financial model of store card economics, provided a detailed analysis of the profitability of the largest store card provider, and examined the impact of a potential APR cap on consumer and producer welfare.
- **Payment Cards** – Advised an international payment card network on the appropriate methodology for setting interchange rates. Performed major empirical studies of the costs to merchants of alternative payment mechanisms in different countries. Also performed numerous consumer surveys in different countries to estimate the consumer benefits of card use, and the potential impact of proposed changes in pricing structure on consumer welfare.
- **Credit Default Swaps** – Analysed and responded to the European Commission's analysis of an alleged conspiracy to frustrate the appearance of exchange trading in credit default swaps (CDS).
- **Bitumen Price Fixing** – Analysed and responded to the European Commission's analysis of an alleged conspiracy to fix the price of bitumen in several European countries. Our analysis showed that the Commission failed to prove its case or properly assess the impact of the alleged conspiracy. Also advised the client with its questionnaire responses.
- **Economic Analysis in Eon/MOL Merger** – Helped analyze and respond to the European Commission's analysis of the Eon/MOL transaction.
- **State Aid in Telecoms** – Analysed allegations that a local authority provided unlawful state aid to an incumbent telecom operator, through preferential investment terms in a JV, set up for the purposes of rolling out an optical fibre network.
- **Gas Demand Forecasting** – Constructed a detailed financial model to forecast demand and revenue for a European gas distribution business under different regulatory scenarios.

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- **Gas Transmission Tariffs in Ireland** – Contributed to reports discussing a proposal for a unified gas transmission system operator in Ireland to avoid discrimination concerns, the relationship between type of capacity contract and amount of firm capacity offered by a gas pipeline, the value of natural gas storage and whether it was reasonably priced, proposed gas balancing rules, the causes of “price spikes” in the Dutch electricity market, future EU cross-border flows, and the appropriate rules for publishing information in the electricity industry to enable liquid trading and avoid conspiracies.

### ARTICLES AND PUBLICATIONS

“The Cost of Capital for the NorNed Cable”, with Carlos Lapuerta and Richard Brealey (June 2004), prepared for the Dutch energy regulator (DTe), available at [http://www.dte.nl/nederlands/elektriciteit/transport/openbaar\\_dossier\\_aanvraag\\_norned\\_kabel.asp](http://www.dte.nl/nederlands/elektriciteit/transport/openbaar_dossier_aanvraag_norned_kabel.asp)

“A Review of the OXERA Report: “Quantifying Antitrust Damages: Towards non-binding guidance for courts”, with Carlos Lapuerta and Dan Harris, *Journal of European Competition Law and Practice*.

“Estimate of Equity Beta for UK Mobile Owners”, (December 2009) with Carlos Lapuerta, prepared for the UK telecoms regulator (Ofcom), and available on the Ofcom website.

“Estimate of the Equity Beta for BSKyB”,(March 2009) with Carlos Lapuerta, prepared for the UK telecoms regulator (Ofcom), and available on the Ofcom website.

“La stima dei Danni nel dritto della concorrenza”, with Carlos Lapuerta and Dan Harris, *Dritto e Pratica della Societa*, (Jun 2010), 35-44.

“The Equity Beta for BT”, (July 2011) with Carlos Lapuerta, prepared for the UK telecoms regulator (Ofcom), and available on the Ofcom website.

“Estimate of BT’s Equity Beta”, (March 2014), with Ilinca Popescu, prepared for the UK telecoms regulator (Ofcom), and available on the Ofcom website.

“Estimate of Equity Beta for UK Mobile Owners (June 2014), with Ilinca Popescu, prepared for the UK telecoms regulator (Ofcom), and available on the Ofcom website.

“Estimate of Equity and Asset Betas for UK Mobile Owners”, (January 2015), with Ilinca Popescu, prepared for the UK telecoms regulator (Ofcom), and available on the Ofcom website.

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“Investigation of Operational Costs of Dutch Distribution Network Operators”, with Dan Harris, prepared for the Dutch energy regulator (EK), available at [http://www.energiekamer.nl/nederlands/elektriciteit/transport/tariefregulering/X-factoren/Methodebesluit\\_vijfde\\_reguleringsperiode\\_regionale\\_netbeheerders\\_elektriciteit\\_vastgesteld.asp](http://www.energiekamer.nl/nederlands/elektriciteit/transport/tariefregulering/X-factoren/Methodebesluit_vijfde_reguleringsperiode_regionale_netbeheerders_elektriciteit_vastgesteld.asp)

“Understanding Pre-Award Interest Rates In Arbitration”, with Dan Harris and Alexis Maniatis, *Law 360* (July 2015). Article also published online by mondaq.com.

“Review of approaches to estimate a reasonable rate of return for investments in telecoms networks in regulatory proceedings and options for EU harmonization” with Dan Harris (2016), prepared for the European Commission.

“Damages in Competition/Antitrust Arbitrations”, with Carlos Lapuerta, chapter in *The Guide to Damages in International Arbitration*, GAR First Edition, (2016).

“Valuing Natural Resources Investments,” with Darrell Chodorow and Florin Dorobantu, chapter in *Emerging Issues on the Law of Damages and Valuation in International Investment*, Brill, (forthcoming).

## EDUCATION

2006-07 Regent College (affiliated to University of British Columbia) Vancouver, Canada Master of Christian Studies (pending)

Graduate level courses in biblical studies, church history, sociology, systematic theology and ethics, with particular focus on marketplace ethics.

1996-2000 Cambridge University Cambridge, United Kingdom,

M Eng in Civil Engineering. Designed and constructed a finite element model of the stress around the edge of an oil well. This project was in conjunction with a large oilfield services company.

BA in Engineering (First Class Honours)