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ANTITRUST REVIEW 2020

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Global Competition Review is a leading source of news and insight on competition law, economics, policy and practice, enabling subscribers to stay apprised of the most important developments worldwide.

 GCR's *Europe, Middle East and Africa Antitrust Review 2020* is one of a series of regional reviews that deliver specialist intelligence and research to our readers – general counsel, government agencies and private practitioners – who must navigate the world's increasingly complex competition regimes.

 Like its sister reports covering the Americas and the Asia-Pacific, this book provides an unparalleled annual update from competition enforcers and leading practitioners, on key developments in both public enforcement and private litigation.

 In addition to updates on the European Commission, Cyprus, Denmark, France, Germany, Greece, Norway, Romania, Portugal, Russia, Spain, Switzerland, Turkey, the United Kingdom, Ukraine, COMESA, Israel, Mauritius and Mozambique, this edition features a chapter on Angola, which launched its Competition Regulatory Authority in early 2019.

 In preparing this report, *Global Competition Review* has worked with leading competition lawyers and government officials. The latter group provides crucial perspective on the thinking behind cutting-edge matters such as the intersection of privacy, data and antitrust; 'phygital' retail distribution that combines brick-and-mortar with online sales; screening tools to detect collusion in public procurement; and much more.

 The lawyers' and officials' knowledge and experience – and above all their ability to put law and policy into context – give the report special value. We are grateful to all of the contributors and their firms for their time and commitment to the publication.

 Although every effort has been made to ensure that all the matters of concern to readers are covered, competition law is a complex and fast-changing field of practice, and therefore specific legal advice should always be sought. Subscribers to *Global Competition Review* will receive regular updates on any changes to relevant laws over the coming year.

 If you have a suggestion for a topic to cover or would like to find out how to contribute, please contact insight@globalcompetitionreview.com.

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Economics: Overview

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Giuseppe Buglione
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BritNed Development v ABB: Are there lessons to be learned on the use of economics and econometrics in cartel damages?[1]

On 9 October 2018, the High Court of England and Wales handed down a landmark judgment in *BritNed Development v ABB*.[2] This was the first cartel follow-on damages claim to reach judgment on the merits in the UK. The claim stemmed from a decision by the European Commission (EC) in 2014, which found that 11 companies (including ABB) colluded at a global level between 1999 and 2009 in the supply of underground and submarine high-voltage power cables (the cartel). Following on from this decision, BritNed, a joint venture between the UK and the Dutch electricity grid operators, filed a €180 million claim against ABB alleging that ABB had overcharged BritNed for the interconnector (a submarine electric cable system connecting the Netherlands with England) it procured in 2007.

Following a 15-day trial, which included oral evidence from economic experts for the claimant and the defendant, the Court concluded that there was no evidence of a cartel overcharge. However, the Court awarded damages of approximately €13 million,[3] owing to two factors:

- 'baked-in inefficiencies,' ie, higher costs in the cable design due to a lack of competitive pressure on ABB; and

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1 Disclaimer: we have not been involved in this litigation. This paper is based on a review and analysis of publicly available documents.

2 *BritNed Development Limited v ABB AB and ABB Limited* [2018] EWHC 2616 (Judgment).

3 This includes simple interest, which was granted at 1-month EURIBOR + 1 per cent.

- cartel savings,[4] ie, savings that ABB was able to realise by not having to compete, for example, at the bidding stage. According to the Court, relevant common costs were allocated to other projects instead, and BritNed should be entitled to receive some of such savings.[5]

To reflect uncertainties related to the loss actually suffered by BritNed, the Court reduced its original estimate of the damages by 10 per cent.[6] Damages were awarded based on the Court's assessment of the economic evidence, which took into account baked-in inefficiencies and cartel savings, as well as an uncertainty adjustment and interest.

From an economics perspective, this is an interesting case. The claimant and defendant experts applied substantially different empirical methodologies to estimate damages. BritNed's economic expert relied on regression analysis to estimate the level of the overcharge and found that there was an overcharge associated with the cartel. Conversely, ABB's economic expert largely eschewed econometrics and instead relied on an analysis that compared ABB's margins across its projects during and after the cartel period. Based on this analysis, the expert did not find evidence that was consistent with the presence of an overcharge. Ultimately, the Court considered that the defendant's expert's non-econometric approach was more reliable and concluded that there was no evidence of overcharge. Beyond these differences, a number of specific market characteristics and data limitations gave rise to a series of challenges in the estimation of damages. In our view, these factors were instrumental in influencing the Court's assessment of the evidence, the weight the Court put on each of the experts' methodologies, and ultimately the Court's conclusions.

Based on our review of the analyses undertaken by both experts and the conclusions of the Court, we consider that econometrics (specifically, regression analysis) can be informative in the context of assessing antitrust damages, even in the case of bespoke products, such as those in this matter. Furthermore, econometrics is useful for evaluating changes in margins and general accounting data in addition to more traditional price overcharges (as was done in this matter). As such, econometrics should not be considered as a separate, incompatible approach.

In this article, we first set out the approach followed by the claimant's economic expert and the defendant's economic expert, respectively, along with the Court's assessment of each. We then highlight a number of economic considerations in each of the experts' analyses. Lastly, we set out our conclusions on the use of economic evidence in the assessment of cartel damages.

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4   The decision to grant damages due to cartel savings raises a number of questions from an economics perspective. In theory, this would suggest that absent the cartel and the associated savings identified in the Judgment, ABB's costs would have been higher in the counterfactual world. To the extent that these higher costs would have been passed on to ABB's customers, then the lack of cartel savings may have led to higher prices in the counterfactual world. We do not explore this issue further but suggest that it raises a number of interesting economic and policy questions.

5   See section I.3 of the Judgment.

6   See paragraph 15(3d) of the *BritNed Development Ltd v ABB AB and ABB Ltd* [2018] EWHC 2913 (Ch), Judgment of 1 November 2018.

BritNed's economic expert's analyses

BritNed's economic expert used regression analysis to estimate damages due to any price over-charge resulting from the cartel. The expert sought to compare statistically the prices charged by ABB for projects during the cartel to prices charged after the cartel period, while controlling for factors potentially affecting those prices.[7] Using this approach, the price differential remaining between the two periods after accounting for other factors would be a measure of the causal impact of the cartel on prices, ie, the price overcharge.

The data used to estimate the regression model consisted of 92 submarine and underground cable projects for which ABB successfully bid in the 2001–2016 period.[8] The expert also included in the regression model a number of variables that sought to control for the key determinants of ABB's project prices at the time of the tender. These included:[9]

- supply-side factors, including proxies for ABB's costs, to account for the impact of input costs and project complexity on prices;[10]
- demand-side factors, to control for the impact of the level of market demand on prices. Due to the absence of publicly available data on demand for high-voltage power cables, the expert used ABB's own projects backlog, ie, an ABB-specific measure of demand;[11]
- product characteristics, in the form of an indicator variable distinguishing between subma-rine and underground projects, to control for any systematic (supply-side) differences between the two groups that are not captured by the supply-side explanatory variables;[12]
- a time trend to capture systematic changes in cable pricing over time, including inflation and production cost efficiencies; and
- an indicator variable to identify the cartel period, which represents the average impact of the cartel on ABB's project prices after controlling for all other variables included in the model.

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7 BritNed's economic expert defined the 'price' of a project as 'the prices ABB agreed with its customers at the point of the tender award.' See paragraph 288 of the Judgment.

8 There were 36 projects included during the cartel and 56 after the cartel. See paragraph 312 of the Judgment.

9 BritNed's economic expert ran a number of different regression specifications as part of sensitivity testing. In addition, as the case progressed, the expert made a number of changes to the model in response to critiques from the defendant's expert. The controls described here reflect the variables ultimately included in the final primary regression model. See paragraph 318 from the Judgment.

10 BritNed's expert did not include ABB's reported costs in the model, as they were considered unreliable for a number of reasons, including inaccurate or unclear reporting, biased cost reporting during the cartel period and the presence of 'baked-in inefficiencies' due to the cartel activity. See paragraph 349 of the Judgment.

11 A large order backlog indicates that demand is high, a situation in which one would expect prices in the market to be higher.

12 A (binary) indicator variable (also referred to as a 'dummy variable') has only two values (0 and 1) and divides data into two groups. In the case at hand, the submarine indicator assumes value 1 for submarine projects and 0 otherwise, and is interpreted as the difference between average prices for submarine and underground projects, after controlling for all the other variables included in the model.

This regression analysis showed that the cartel activity led, on average, to a 21.8 per cent increase in the prices of ABB's projects and that this increase was statistically significant.[13] The other variables included in the regression analysis also had statistically significant and economically intuitive results, namely, as the proxy for ABB's costs increased the price of a project increased. Based on these results, the expert concluded that the model was well specified,[14] in other words, that the key determinants explained the performance of project prices and that the cartel led to a statistically significant increase in ABB's project prices.

The Court's evaluation of BritNed's expert's findings

Overall, the Court disagreed with the approach of estimating an average cartel overcharge across all ABB projects during the cartel period, as opposed to focusing on the BritNed project alone. In the Court's view, the construction and installation of high-voltage cables are so bespoke that computing an average effect across all such projects could result in a damages estimate that would be irrelevant for any given project. In the Court's view, then, the regression approach adopted by the claimant's expert was not appropriate for estimating damages in this case.[15]

Beyond this, the Court was also concerned with a number of specific characteristics of the model, namely the lack of precision of the estimated overcharge and the sensitivity of the model to changes in the variables and data included.[16] While the estimated overcharge was statistically significantly different from zero (ie, there was a positive effect on prices during the cartel period), the confidence interval around the estimate was very large.[17] The Court did not find useful the fact that the confidence interval around the overcharge estimate ranged from 0.32 per cent to 38.71 per cent.[18] In monetary terms, this translated into an overcharge estimate that ranged between €0.89 million and €108.7 million, which the Court interpreted as 'an indicator that the model is not producing useful outcomes such that [the Court] can rely upon'.[19]

The Court also noted that the results of the econometric analysis (including the statistical significance of the estimated overcharge) were highly sensitive to changes to the model specification. In particular, excluding (i) projects during the cartel period other than BritNed;

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13 Statistical significance is a measure of the probability that the observed estimate is due to chance. The 1, 5 and 10 per cent statistical significance levels that are typically considered in regression analysis indicate that there is less than a 1, 5 or 10 per cent probability of having observed the relationship of interest from the data, when in fact no such relationship exists (ie, when in fact the value of the coefficient is zero).

14 See paragraph 320 of the Judgment.

15 See paragraph 421 of the Judgment.

16 The Court also disagreed with using proxies for ABB's costs instead of using ABB's own cost data extracted from ABB's Product Pricing Models.

17 The confidence interval can be defined, broadly speaking, as a range around the point estimate within which one can expect with a certain degree of confidence that the true value of the overcharge will fall.

18 The coefficient associated to the cartel dummy was statistically significant at the 5 per cent confidence level. The reported confidence interval represents the range within which one can be 95 per cent confident that the true coefficient will lie.

19 See paragraph 418 of the Judgment.

(ii) underground cable projects; (iii) the time trend variable; and (iv) the 'order backlog' demand control factor led to substantially different results. While the Court acknowledged that an effect on the results would be expected if variables that should be included as a matter of theory were excluded, it found that the impact of removing the data or variables on the regression results was 'disproportionate', which cast doubts on the reliability of the model.[20]

Ultimately, the Court determined that it could not rely on the methodology or overcharge estimate produced by the claimant's expert. In reaching this opinion, the Court relied heavily on the sensitivities analyses undertaken by the defendant's economic expert.[21]

ABB's economic expert's analyses

ABB's economic expert adopted a different approach to the assessment of any potential overcharge. Instead of analysing prices, the expert undertook a descriptive assessment and comparison between ABB's margins on the BritNed project and those on similar projects in the post-cartel period. According to the expert, 'systematically' higher ABB margins on the BritNed project when compared with post-cartel projects would provide evidence of a price overcharge due to the cartel. Similar or lower margins on the BritNed project, by contrast, would point towards the absence of an overcharge.[22]

This analysis relies on comparing the margins on a like-for-like basis such that any difference between margins in the cartel period and those in the post-cartel period is attributable to the impact of the cartel. To this end, ABB's expert excluded underground projects and focused exclusively on submarine projects. In addition, the expert constructed a standardised method of computing ABB's gross margins instead of relying on ABB's reported gross margins[23] in order to ensure consistency in the cost components considered when running comparisons across projects.[24]

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20 The Court acknowledged that the inclusion or exclusion of certain variables (such as the orders backlog) and observations (such as non-BritNed projects in the cartel period) relate to the methodological approach and that therefore the change in results following their exclusion should not necessarily be viewed as an error. However, it also pointed out that it disagreed with the motivations for their inclusion and hence assigned significant weight to the volatility of results in the various sensitivities. See paragraphs 379, 380, 387, 417 and 418 of the Judgment.

21 By applying the results of BritNed's expert's econometric model to project-specific data, ABB's expert estimated project-specific overcharges and found a significant degree of variation among them. Specifically, while the estimated overcharge for the BritNed project was 21.8 per cent, the estimated values were very small (ie, around 5 per cent), negative, or very large (ie, above 40 per cent) for several of the remaining projects. See paragraph 418(2) b-d of the Judgment.

22 See paragraph 323 of the Judgment.

23 ABB's expert focused exclusively on gross margins, ie, margins on direct project-specific costs. This approach is consistent with economic theory and avoids the need to address the complex issue of common cost allocation.

24 This measure of gross margins is calculated deducting from revenues the costs related to the following items: (i) cables manufacturing; (ii) cables designing and testing; (iii) cables accessories; (iv) cables transportation to installation sites; (v) cables installation; (vi) project management; (vii) insurance, taxes and similar items; and (viii) provisions for cost overruns and project risks. See paragraph 329 of the Judgment for more details.

Based on this analysis, the expert found that the gross margin earned by ABB on the BritNed project was the same or lower than post-cartel margins on comparable projects and, as a result, concluded there was no evidence of a price overcharge.

The Court's evaluation of ABB's expert's findings

The Court found ABB's expert's approach conceptually easy to understand, as it was an intuitive comparison between the BritNed project and similar post-cartel projects.[25] In addition, the Court noted that the approach was 'very closely related to the facts and to the data produced by ABB' and that it did not require the use of proxies, which, the Court considered, introduced uncertainties into BritNed's expert's model.[26] Finally, the Court liked the fact that ABB's expert's model calculated a BritNed-specific overcharge, as opposed to the average overcharge estimated by BritNed's economic expert.[27]

The Court, however, identified a number of shortcomings in the expert's methodology, namely that it did not sufficiently control for baked-in inefficiencies and cartel savings.[28] In particular, baked-in inefficiencies are 'structural within the business of the cartelist'[29] and, as such, are embedded in ABB's direct costs. As the defendant's expert did not include controls for these inefficiencies, the analysis did not account for them.[30] Similarly, the Court considered that cartel savings could impact either direct or common costs. To the extent that cartel savings affected common costs, they were excluded from the analysis as it focused only on direct costs but, as with baked-in inefficiencies, did not control for any cartel savings present in direct costs.[31]

Despite these criticisms, the Court ultimately decided that ABB's expert's approach was preferable to BritNed's expert's approach, concluding that there was not sufficient evidence for the existence of a price overcharge on the BritNed project. In a context of very limited reliable data, the Court valued parsimony, viewing BritNed's expert's econometric analysis as 'too complex' and 'unspecific.'[32]

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25 See paragraph 345 of the Judgment.

26 ibid. Importantly, the Court's view that ABB's costs are reliable (discussed in section I.5.b.ii of the Judgment) is central to this conclusion.

27 See paragraph 348 and section I.5.d of the Judgment.

28 See paragraph 415(1) of the Judgment.

29 See paragraph 365 of the Judgment.

30 See paragraph 456 of the Judgment.

31 See paragraph 457 of the Judgment.

32 See paragraph 417 of the Judgment.

Our economic assessment of some key methodological choices by the experts

While both of the approaches put forward by the experts are conceptually reasonable from an economics perspective, the application to the facts of the case raises a number of methodological questions. In this section, we provide some insight into issues around the precision of econometric estimates, the accounting and economic considerations necessary when computing and analysing margins, and the use of econometrics in margin analyses.

Small sample sizes and regression precision

As noted above, the Court criticised a number of aspects of BritNed's expert's price regressions based on its perception of both a lack of precision in the damages estimate and a lack of model stability. These issues, however, were specific to the model applied to this matter, and, crucially, do not undermine the use of regressions for the assessment of overcharges in cartel damages actions in general. While there may be several reasons for the lack of precision in a regression model, one key reason may be a small sample size.[33] This is because small sample sizes can lead to large confidence intervals around coefficient estimates and can result in the model failing to identify a relationship of interest.[34] Indeed, this potential issue was identified by BritNed's expert, as the data available to the experts contained only 49 submarine projects in which ABB presented a successful bid over the 2001–2016 period (15 during and 34 after the cartel period).[35]

In general, there are two ways to address the sample size issue: increase the size of the sample or use statistical techniques developed to account for small samples. BritNed's expert adopted the former approach, and attempted to alleviate this issue by increasing the sample size used to estimate the model. The expert did this by including in the analysis projects considered to be similar, but not identical, to those at issue in the cartel, namely underground projects. Including these projects, and controlling for their inclusion, increased the sample size of the model; however, it was at the cost of decreasing the reliability of the model. ABB's expert argued that the underground projects were substantially different from submarine projects,[36] and that when excluded from the analysis the estimated cartel overcharge was not statistically significantly different from zero.[37]

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33 Another reason for the lack of precision in a regression may be the 'quality' of the existing data. For example, there was considerable discussion in the Judgment about the reliability of using ABB's 'order backlog' as a proxy for capacity utilisation. See, for example, paragraphs 402-413 of the Judgment. For the purpose of this discussion, we focus only on a discussion of small sample size.

34 Small sample sizes can lead to a reduction in the statistical power of a model.

35 See paragraph 312 of the Judgment.

36 See paragraph 389 of the Judgment.

37 ABB's expert replicated BritNed's expert's regressions restricting the analysis to the sample of submarine projects. This resulted in an overcharge estimate not too dissimilar from the one obtained when using BritNed's expert's sample. However, restricting the analysis to submarine projects affected the statistical significance and the sign of the estimated coefficients for the remaining control variables. According to ABB's expert, this signalled that BritNed's expert's model was not effective in controlling for systematic differences between submarine and underground projects. See paragraphs 388-397 of the Judgment.

The second approach to dealing with small samples is to apply well-known and widely accepted statistical methods. These simulation-based approaches are designed precisely for conducting statistical analysis in the presence of samples that would normally not be considered large enough. For example, bootstrapping is a common small-sample estimation technique. Broadly speaking, it consists of creating a large number of simulated samples starting from the available data and replicating the estimation exercise on each sample. If the number of simulated samples is large enough, the results can be used to determine the degree of statistical significance of the estimated coefficients. This is a well-known, standard statistical technique that is commonly applied by competition enforcers and academic economists.[38]

While it is always preferable to obtain more data for a regression analysis, in cases where such data are imperfectly related to the product of interest, and where there are limited methods to control for these differences, small-sample statistical methods are oftentimes the preferred approach for dealing with small samples. In BritNed, running regressions applying these small-sample methodologies, possibly alongside other approaches such as including underground projects, may have offered an alternative and perhaps more convincing approach, and may have helped increase the precision of the estimate of the overcharge, if any.

Economic and accounting considerations in margin analysis

ABB's expert's margin analysis was intuitive and understandably appealing to the Court. However, the analysis of accounting data for the purpose of economic analysis is far from simple and oftentimes requires a thorough understanding both of the principles of accounting and of the internal procedures of firms involved.

As discussed above, the expert eliminated part of the complexity in having to deal with ABB's internal cost allocation methods by focusing on gross margins. However, constructing a measure of margins that is not based on a standard metric may require making assumptions that may introduce unknown imprecision into the analysis. For example, in constructing the measure of gross margins, ABB's expert adopted the following adjustments:

- the expert excluded from the calculation 'any cost item … not consider[ed] to be directly attributable to the specific project in question';[39]
- in some instances, the expert combined margins from different business units within ABB, if it emerged from the analysis that more than one business unit was involved in the project;[40]

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38 Efron first introduced the bootstrapping methodology in 1979 (see Efron, B (1979), 'Bootstrapping Methods: Another Look at the Jackknife', *Annals of Statistics*, 7, 1–26) and it has since been refined by a number of economists. For a description of this methodology and its numerous applications, see *Econometric Analysis* (William H Greene, 8th Edition, Section 15) and *Microeconometrics* (Cameron and Trivedi, 2005, Chapter 11).

39 See paragraph 330 of the Judgment.

40 See paragraph 326 of the Judgment.

- the expert 'considered that the cost items [...] had been accounted for by ABB in a consistent manner over time;'[41] and
- the expert extracted margins information from ABB's Product Pricing Models (PPMs).

If any of these adjustments or assumptions are inconsistent with the realities of ABB's historical cost accounting, reporting and allocation practices during or after the cartel period, then an element of imprecision, perhaps significant, has been introduced in the analysis.[42] Such imprecision could potentially result in the comparison of margins during and after the cartel being misleading. In these cases, it is important to run a series of sensitivity analyses around the construction of margins, and ensure that the constructed margins are in line with actual accounting practices.

The use of econometrics in margin analysis

However, even assuming that margins were accurately measured, the key question remains whether the gross margins calculated by ABB's expert reflected the full impact of the cartel. For example, there is no discussion in the Judgment of any analyses performed to assess whether any factors other than the existence of the cartel, such as changes in demand, level of competition or regulation, could have affected the level of margins. An increase in margins in the post-cartel period may be due to a contemporaneous decrease in input cost components (or increased efficiency). If this effect more than compensates for the reduction in margins following the end of the cartel, then a simple comparison of during- and post- cartel margins would erroneously conclude that the cartel had no effect on margins and that therefore there is no price overcharge. In other words, even if ABB's gross margin during the cartel was in line with its gross margins after the cartel, this does not mean that but for the existence of the cartel it may not have been lower.

Econometric analysis can be used in a margin analysis to control for these factors. For example, including supply and demand drivers as explanatory variables in a regression on margins allows for the estimation of 'adjusted' margins that account for the impact of such economic factors. Comparing these adjusted margins during and after the cartel can provide an estimate of the impact of the cartel controlling for relevant economic conditions not affected by the cartel.

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41 See paragraph 330 of the Judgment.

42 Additionally, BritNed's expert raised the issue that a 'baked-in inefficiency' may have biased the cost reporting in the cartel period. The Court, however, ultimately considered that the doubts raised by BritNed's expert and the available evidence were insufficient to dismiss the use of the cost data for economic analysis and that therefore this did not cast any specific doubts on the validity of ABB's expert's analysis.

Conclusion

BritNed Development v ABB was a landmark judgment in the UK, representing the first follow-on damages action to reach judgment on the merits. As such, it raises a number of interesting questions as to how economic evidence will be treated in future follow-on damages actions. While the Court largely dismissed econometric evidence in this matter and relied instead on a simpler margin analysis, it did so largely on the assessment of case-specific evidence. Therefore, in our view, it does not mean that econometric evidence can no longer be used to assess potential damages in follow-on cartel actions. Rather, it highlights the importance of ensuring that any econometric evidence presented in court is rooted in the facts and data of the case, that it is clearly set out in an intuitive fashion, and that key limitations are highlighted and addressed.

Moreover, the use of econometric evidence is not restricted to the assessment of price determinants, but can be used to ensure that any margin analysis correctly controls for systematic differences in cost or demand drivers across the relevant periods. Failing to control for such systematic differences can render simple comparisons invalid and provide a misleading assessment of the impact, if any, of the cartel.

Ultimately, while the Judgment provides a number of useful insights for the use of economic evidence, the analytical techniques used in future follow-on damages actions should be selected on the facts of the case and the availability of data.

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Dr Mishol, principal, is an economist who specialises in competition, securities, econometrics, microeconomic theory, statistics, healthcare and pharmacoeconomics. He has provided consulting support to counsel throughout many phases of litigation, including preparation of expert deposition and trial testimony; development, presentation and review of pretrial discovery; and critique of analyses of opposing experts. He has served as an expert witness and worked with leading academic scholars, providing economic and damages analysis on matters involving cartels and mergers; analysis of market definition issues in a variety of industries; economic, financial and quantitative analyses related to allegations of securities fraud in Rule 10b-5, ERISA and structured finance matters; and economic, quantitative and damages analyses in the pharmaceutical industry. Outside of litigation, Dr Mishol has used sophisticated econometric modelling techniques to help major pharmaceutical companies make product entry decisions by assessing the impact of market factors such as product quality, pricing, patent expiration and regulatory policy on the demand for prescription pharmaceuticals.

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Mr White has worked in a number of jurisdictions, including the United States, the United Kingdom, Canada, Japan and Belgium. He has served as a testifying expert in the Upper Tribunal (Lands Chamber) on competition matters related to restrictive land covenants. Mr White has supported several clients before the European Commission on cartel and merger matters, and has provided support to a number of European financial and competition regulators in coordinated conduct investigations. In addition, he has provided testimony and submissions to the UK's Competition and Markets Authority on behalf of clients involved in market investigations and mergers.

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Dr Calcagno has published in international peer-reviewed academic journals and is coauthor of the textbook *Exclusionary Practices: The Economics of Monopolisation and Abuse of Dominance*. He frequently speaks at competition policy events and is a guest lecturer at LLM and MBA programs. Prior to joining Analysis Group, Dr Calcagno was an associate director in the economics practice of a Big Four accounting firm. He is fluent in French, Italian, Portuguese and Spanish.

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Analysis Group is one of the largest international economics consulting firms, with more than 950 professionals across 14 offices in North America, Europe and Asia. Since 1981, we have provided expertise in economics, finance, healthcare analytics and strategy to top law firms, Fortune Global 500 companies and government agencies worldwide. Our internal experts, together with our network of affiliated experts from academia, industry and government, offer our clients exceptional breadth and depth of expertise.

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