THE INVESTMENT TREATY ARBITRATION REVIEW

FIFTH EDITION

Editor
Barton Legum

THE LAWREVIEWS

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CONTENTS

PREFACE

This year's edition of *The Investment Treaty Arbitration Review* goes to press under particular circumstances. Measures to contain the covid-19 pandemic around the world have confined authors to quarters. Despite these constraints, the authors of this volume have delivered their chapters. The result is a new edition providing an up-to-date panorama of the field. This is no small feat given the constant flow of new awards, decisions and other developments over the past year.

Many useful treatises on investment treaty arbitration have been written. The relentless rate of change in the field rapidly leaves them out of date.

In this environment of constant change, *The Investment Treaty Arbitration Review* fulfils an essential function. Updated every year, it provides a current perspective on a quickly evolving topic. Organised by topic rather than by jurisdiction, it allows readers to access rapidly not only the most recent developments on a given subject, but also the debate that led to and the context behind those developments.

This fifth edition adds new topics to the *Review*, increasing its scope and utility to practitioners. It represents an important achievement in the field of investment treaty arbitration. I thank the contributors for their fine work in developing the content for this volume under the difficult conditions prevailing today.

Barton Legum
Dentons
Paris
May 2020

Part V

Damages

Chapter 24

CAUSATION

Chudozie Okongwu and Erin B McHugh[1]

I INTRODUCTION

Most investment treaty arbitrations involve a claim that a respondent state has breached its obligations under an investment treaty.[2] A claimant's recoverable damages are limited to those caused by the respondent state's wrongful act (or acts). Establishing causation or a 'causal link' between the wrongful act and the harm claimed is thus a critical element in a damages determination.

In this chapter, Section II sets out the principles of causation as described in the International Law Commission Articles on State Responsibility (the ILC Articles). Section III discusses some arbitral awards that have dealt with certain key issues that have arisen in interpreting these principles of causation. Section IV describes how a statistical technique called 'regression analysis' can be used to help assess causation and addresses some of the questions raised in the awards discussed in Section III.

II PRINCIPLES OF CAUSATION

The ILC Articles codify customary rules of international law concerning the responsibility of states for 'internationally wrongful acts'. Article 2 states that 'a breach of an international obligation of the State' (such as an investment treaty) is considered an 'internationally wrongful act'.[3] Article 31 articulates the principle of causation in the context of assessing damages for such acts, stating:

> *1. The responsible State is under an obligation to make full reparation for the injury caused by the internationally wrongful act.*
>
> *2 Injury includes any damage, whether material or moral, caused by the internationally wrongful act of a State.*[4]

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1 Chudozie Okongwu is a managing director and Erin B McHugh is an associate director at NERA Economic Consulting. The authors would like to thank Timothy McKenna, Robert Patton and Raphael Starr for their assistance in relation to this chapter.

2 Some treaties may provide a jurisdictional basis for arbitrating other types of disputes, such as contractual disputes arising from investment agreements. See Abby Cohen Smutny, 'Principles Relating to Compensation in the Investment Treaty Context', 19 September 2006, pp. 1–2.

3 James Crawford, *The International Law Commission's Articles on State Responsibility: Introduction, Text and Commentaries*, 1st edition, Cambridge, UK: Cambridge University Press, 2002, p. 81.

4 Crawford, p. 201.

Thus, reparation is to be made only for the injury 'caused by' (i.e., 'resulting from and ascribable to')[5] the wrongful act. Losses because of unforeseeable events or other concurrent factors may be excluded in the calculation of recompense.

Arbitral awards have clarified that establishing causation entails showing both 'factual causation' (also referred to as 'cause in fact') and 'legal causation'. Factual causation is typically determined through an analysis of whether the injury would have occurred 'but for' the state's wrongful act (i.e., in the 'counterfactual' or 'but-for' scenario). Economic tools can be used (as described in Section IV) to isolate the injury caused by the wrongful act from that caused by other factors (e.g., an economic downturn).

Even if an injury can be factually linked to a wrongful act, there may be legal limits on liability.[6] Legal causation relates to whether the causal link between the wrongful act and the claimed injury is sufficiently proximate to require reparation. The commentary to Article 31 of the ILC Articles states:

> *[C]ausality in fact is a necessary but not a sufficient condition for reparation. There is a further element, associated with the exclusion of injury that is too "remote" or "consequential" to be the subject of reparation. In some cases, the criterion of "directness" may be used, in others "foreseeability" or "proximity".*[7]

Here, foreseeability concerns whether the state could have reasonably foreseen that its wrongful act would cause the claimed damages. The commentary to Article 31 explains that other factors may also be relevant in establishing legal causation. Moreover, the relevant criteria may differ from case to case depending upon the specifics of the breach.[8]

III DISCUSSION OF CAUSATION IN ARBITRAL AWARDS

i Biwater v. Tanzania: Factual causation

A frequently cited investment treaty arbitral award analysing issues of causation is that rendered by the ICSID tribunal in *Biwater v. Tanzania*.[9] Biwater, a British water company, had invested in the water and sewerage system of Dar es Salaam and the surrounding area. Biwater claimed that actions by Tanzania constituted an expropriation of Biwater's investment and unreasonable or discriminatory treatment in violation of the Tanzania–United Kingdom bilateral investment treaty (BIT).

In its award dated 24 July 2008, the tribunal analysed the issue of causation at length, finding that the claim failed on factual causation grounds. The award states:

5 Crawford, p. 204.

6 Craig Miles and David Weiss, 'Overview of Principles Reducing Damages', in *Global Arbitration Review: The Guide to Damages in International Arbitration*, 1st edition, ed. John A. Trenor, London: Law Business Research, 2016, p. 79.

7 Crawford, p. 204.

8 ibid.

9 *Biwater Gauff (Tanzania) Ltd. v. United Republic of Tanzania*, ICSID Case No. ARB/05/22, Award, 24 July 2008.

> *There is little guidance as a matter of international law on the precise test of causation to be applied (there being a number of different possible formulations) . . . . The key issue in this case is the factual link between the wrongful acts and the damage in question, as opposed to any issue as to remoteness or indirect loss.*[10]

Although the tribunal considered the respondent's actions to constitute an illegal expropriation, the tribunal was persuaded by the respondent's expert that Biwater's investment was of no economic value at the date of the expropriation because of serious problems already existing with its performance.[11] Thus, the tribunal found that none of the respondent's violations of the BIT 'in fact caused the loss and damage in question, or broke the chain of causation that was already in place'.[12]

One of the arbitrators in the matter, Gary Born, disagreed with the conclusion by the other tribunal members (representing the majority) that the claim failed on causation grounds. In a 'Concurring and Dissenting Opinion' issued in connection with the award, Mr Born stated that it was clear that the respondent's actions had caused injury to Biwater by 'depriving it prematurely of the use and enjoyment of its property'.[13] However, Biwater's claim for monetary damages failed because the injury 'had no quantifiable monetary value'.[14] Mr Born considered the majority's analysis to have confused issues of causation with the quantum of damages.

ii Metalclad v. Mexico: Remoteness

The 30 August 2000 award rendered by the tribunal in the *Metalclad v. Mexico* ICSID arbitration considered the issue of remoteness with respect to causation.[15] Metalclad claimed that Mexico had interfered with its development and operation of a hazardous waste landfill (the La Pedrera development), thereby violating the investment provisions of the North American Free Trade Agreement.

Although the tribunal awarded Metalclad damages for its investment in the project, the tribunal disallowed an additional claim made by Metalclad on causation grounds. In particular, Metalclad had sought an additional US$20–25 million in damages for the alleged negative impact that the respondent's conduct had on its other business operations by reference to the change in the company's share price during the relevant period. The award states:

> *The Tribunal disallows this additional claim because a variety of factors, not necessarily related to the La Padrera development, have affected Metalclad's share price. The causal relationship between Mexico's actions and the reduction in value of Metalclad's other business operations are too remote and uncertain to support this claim. This element of damage is, therefore, left aside.*[16]

Hence, here the claim failed because the tribunal considered the causal link between the respondent's actions and the claimed damages to be 'too remote and uncertain'. Specifically, the claimants had failed to show that factors related to the La Padrera development, and not other factors, led to declines in Metalclad's share price.

iii Micula v. Romania: Sufficient certainty

The 11 December 2013 award in *Micula v. Romania* clarified the degree of certainty required to establish a causal link between an alleged wrongdoing and claimed damages.[17] Claimants were Swedish nationals who claimed that they had made investments in several manufacturing companies in Romania in reliance upon certain economic incentives introduced by the state in 1998. These economic incentives were revoked in 2005 in the context of Romania's accession to the European Union. The claimants alleged that the revocation caused damage to their investments and breached their rights under the Sweden–Romania BIT.

In addition to claims for actual or realised losses directly resulting from the revocation, claimants also advanced several claims for lost profits. The tribunal acknowledged in its award that lost profits must be established with 'sufficient certainty'.[18] The tribunal stated that 'the sufficient certainty standard is usually quite difficult to meet in the absence of a going concern and a proven record of profitability', but that these claims must be considered 'on a case by case basis, in light of all the factual circumstances'.[19]

The claimants' first such claim was for lost profits on sales of finished goods. The claimants alleged that increased costs (resulting from the revocation) caused them to increase prices on finished goods and thereby lose market share and profits. The claimants' expert employed the statistical technique of regression analysis (which will be described in the next section) to estimate the relationship between prices and market share for the relevant goods, and used the regression results to estimate a but-for market share had the price increases not been made. The claimants' expert assumed that revocation of the economic incentives had caused claimants to increase prices, relying upon witness evidence as well as 'the evidential pattern and timing of the price increase'.[20]

The tribunal accepted the claimants' arguments with respect to causation in the absence of 'another, more plausible explanation' for the price increase.[21] The tribunal also found that the claimants had proved this claim with 'sufficient certainty'.[22] However, the tribunal rejected the claimants' other claims for lost profits, as they related to new lines of business in which claimants never actually engaged (but purportedly would have entered but for the respondent's wrongful acts).[23]

iv Conclusion

These decisions make clear that empirical evidence that supports or refutes an alleged causal link between a state's actions and any claimed injury would be of assistance to an arbitral tribunal in reaching a fully informed decision. The claim in *Metalclad v. Mexico* failed because the claimants had not distinguished the effect of the wrongful act from other (concurrent) factors affecting the share price. Interestingly, in *Micula v. Romania*, the tribunal's award stated that the presence of other concurrent factors contributing to the injury does not necessarily break the chain of causation from the state's wrongful act. The tribunal considered that under

the ILC Articles, a state is held responsible for all consequences 'not being too remote' of its conduct, unless there is contributory fault by the injured party or an identifiable element of injury can be allocated to the concurrent causes.[24]

Economic tools can help to distinguish harm resulting from an alleged wrongful act from losses attributable to other factors. In the next section, we discuss one of these tools – regression analysis.

IV THE USE OF REGRESSION ANALYSIS TO ASSESS CAUSATION

In the previous section, we discussed one arbitral award (*Micula v. Romania*) where a regression analysis was used by one of the experts (in concert with witness testimony and other evidence) to establish causation with respect to damages. To our minds, however, regression analysis remains an underutilised tool in investment treaty arbitration. For example, where there is a claim for lost profits, regression analysis can be used as a control for other factors affecting a company's profits (e.g., economic conditions) to isolate any decline in profits attributable to an alleged wrongful act.

Regression analysis allows an economist to evaluate the relationship between a variable of interest (the dependent variable) and one or more other factors that may help explain movements in the variable of interest (these are referred to as explanatory or independent variables). This technique allows an economist to isolate the impact of a particular factor on the variable of interest, by controlling for other factors. The results of a regression model can shed light on whether the proposed explanatory variables meaningfully explain the observed variation in the dependent variable (i.e., whether the estimated 'coefficients'[25] on the explanatory variables are deemed 'statistically significant').[26] Regression analysis also produces estimates with known rates of statistical error. This means, for example, that using regression analysis we may find that the probability that the observed change in a company's profits results from chance alone (rather than as a result of the alleged wrongful act) is one in 20 (5 per cent) or less.[27] If the regression results support the proposition that, after controlling for other relevant factors, there is very little chance that the observed decline in profits was attributable to anything other than the alleged wrongful act, these findings could

24 ibid., paras. 925–926.

25 The estimated coefficients show the relationship between the dependent variable and the explanatory variables.

26 In broad terms, this is done by examining the covariance of the explanatory variable and the dependent variable, and determining whether the observed degree of covariance is unlikely to occur exclusively owing to chance (say, only 5 per cent of the time). Common standards used to deem something 'unlikely' include if an outcome has a probability of occurring of only 1 per cent (or less) or 5 per cent (or less). For details, see Federal Judicial Center, *Reference Manual on Scientific Evidence*, 3rd edition (Washington, DC: National Academies Press, 2011), pp. 249–253.

27 The assessment of the probability that an observed result is owing to chance is an inference from a statistical test. The typical framework for this test is to assume that a factor (in this case, the alleged wrongful act) has no impact on the variable of interest (in this case, profits). Under this assumption, one then computes the probability that the estimated size of the effect on profits could occur owing to chance. See Robert V Hogg and Allen T Craig, *Introduction to Mathematical Statistics*, 5th edition, Englewood Cliffs, NJ: Prentice Hall, 1995, pp. 280–287.

provide powerful evidence of causation to an arbitral tribunal. However, the regression results may attribute some or all of the observed decline in profits to factors other than the alleged wrongful act – thereby providing evidence to refute a claimed causal link.

In this section, we present two hypothetical scenarios inspired by the types of disputes that can arise in the context of investment treaty arbitration. For each of these hypothetical scenarios, we discuss how regression analysis could be employed to assist the tribunal in limiting the losses under consideration to those caused by the alleged wrongful act or acts.

i Hypothetical scenario 1: Claimed lost profits owing to fair and equitable treatment violation

Consider the example of Global Construction Enterprises Ltd (GCE), a (fictional) privately held, UK-based construction firm. GCE builds commercial office space worldwide, but over 40 per cent of the firm's profits come from its operations in the Republic of Freedonia.

On 1 April 2010, the Freedonian government announced a new construction-permitting policy that allegedly discriminated against non-Freedonian firms, breaching the fair and equitable treatment standard under the Freedonia–UK BIT. The allegedly discriminatory policy remained in place until the end of 2012, when it was rescinded. GCE is now pursuing compensation for lost profits from Freedonia under the BIT, asserting that the firm's revenues and profits during the period from April 2010 to December 2012 would have been greater but for Freedonia's allegedly discriminatory policy.

How one might establish causation will depend upon the available evidence. For instance, if there was clear evidence indicating specific projects for which GCE would have won contracts but for the new construction permitting policy, this would assist in establishing causation for losses associated with those projects. However, let us assume that here no such unambiguous evidence is available. GCE's profits during the relevant period were affected not only by the allegedly discriminatory policy, but also by other factors. It is therefore necessary to isolate the impact of the state's actions on GCE's profits. Regression analysis lends itself to such an exercise.

An economist would consider the market forces that drive GCE's business in Freedonia. Potential explanatory variables for GCE's profits might include commercial mortgage interest rates, central bank rates, commercial real estate prices, overall construction activity and proxies for the overall business climate, such as GDP growth or business confidence.

To perform a regression analysis, one would collect data for each of these variables at regular intervals (for instance, on a monthly basis). One could then estimate a regression model using the data for these variables to explain GCE's monthly profits (as the dependent variable).[28] To estimate the impact of the alleged discriminatory policy, one could add a binary 'indicator' variable to the model specification. This indicator variable would take a value of one during the months where the allegedly discriminatory policy was in place – April 2010 to December 2012 – and zero in the other months.

In this model, the estimated coefficient for the indicator variable measures the average difference between GCE's profits during the months where the allegedly discriminatory policy was in place and the months where it was not, controlling for the other factors that explain GCE's profitability. If the estimated coefficient is negative and statistically significant, this

28 For ease of understanding, we explain the approach using profits as the dependent variable. In some cases, it may be more appropriate to estimate the model using revenues as the dependent variable. Cost assumptions would then be used to estimate the profit impact of the alleged wrongful act.

could provide compelling evidence to an arbitral tribunal that the allegedly discriminatory policy caused a reduction in GCE's profits. It could also form the basis for a damages estimate. This estimate would be limited to the injury caused by the alleged wrongful act, as the regression model controls for the other factors affecting GCE's profitability.

ii Hypothetical scenario 2: Claimed discriminatory tax policy

Let us assume that PubliCo is a publicly traded manufacturing company operating in Freedonia. The majority owner of PubliCo is a UK-based holding company, HoldCo. In early 2015, Freedonia unexpectedly announced a substantial tax increase applicable to PubliCo, from 25 per cent to 50 per cent (the first tax increase). Six months later, Freedonia unexpectedly announced a second tax increase applicable to PubliCo, from 50 per cent to 75 per cent (the second tax increase). Both tax increases applied only to manufacturing companies whose majority owners were based outside Freedonia.

Let us further assume that PubliCo submits a request for arbitration claiming damages for discriminatory treatment under the UK–Freedonia BIT. Respondent Freedonia disputes causation with respect to PubliCo's damages, claiming that other factors, such as a concurrent economic downturn, affected PubliCo's profitability.

Although there are several methods that could potentially be used to assess damages in such a case, discussing all such methods is outside the scope of this chapter. We will focus on one method and its relevance to issues of causation – the application of regression analysis to perform an 'event study'. The event study is a well-established empirical technique that is used to measure the market's assessment of the impact of a specific event or announcement on a company's market value – here, for example, the announcements of the two tax increases.

An event study is a particularly effective technique for assessing damages in cases where, as here, there is a discrete announcement or announcements of the alleged breaches. Because, as elaborated upon below, the price of a company's shares reflects the present discounted value of the cash flows expected to accrue to shareholders, the event study can be thought of as the market's assessment of the effect of the breach on discounted future cash flows. An advantage of the event study method is that it employs actual market data rather than potentially subjective assumptions. It can be used where the company in question has shares that are publicly listed and are traded in a liquid market.

It is particularly useful in the context of establishing causation as it allows one to isolate the impact (if any) of an alleged wrongful act from other factors influencing the company's share price (e.g., market and industry-wide factors).[29] Regression analysis is used to model the counterfactual scenario – namely, the predicted change in share price (share price 'return') but for the alleged wrongful act. Tests of statistical significance may allow one to conclude, for example, that there is only a 5 per cent chance or less that the observed share price movement is owing to chance alone (rather than resulting from the alleged wrongful act). An arbitral tribunal could arguably find such results compelling for the purposes of determining causation.

29 Recall that in the *Metalclad v. Mexico* award, the tribunal rejected a claim for damages where the claimants had not isolated the impact of the alleged wrongful act from other factors affecting the share price. It is possible, depending on the timing and nature of these factors, that an event study may have been able to assist in such an exercise.

The event study method is extensively used and has been applied in hundreds of articles in leading academic journals.[30] It is also the most widely used method for proving and establishing loss causation and damages in US securities litigation.[31] The method is premised on two assumptions: (1) that a company's share price equals the market's estimate of the present value of the cash flows expected to accrue to holders of those shares; and (2) that the company's share price reflects all publicly available information and adjusts quickly to new information (i.e., semi-strong market efficiency).[32] Market efficiency, like liquidity, is a continuum, with shares trading in more well-developed and liquid markets generally exhibiting a higher degree of market efficiency. An economist can perform tests of market efficiency to determine whether the event study method is applicable for a particular company's shares, in a particular market and at a particular point in time.

Let us assume for present purposes that one has performed tests of market efficiency for PubliCo and has determined that the event study method is applicable. The steps involved in estimating damages using the event study method are described in the following subsections.

Prepare a detailed chronology of events and identify the relevant dates

The first step is to prepare a detailed chronology of all news potentially affecting the company's share price during the period of examination. This would include company-specific news, as well as news relating to the industry in which the company operates. The contents of the chronology might also be supplemented with fact witness testimony to the extent that this provides further context to events potentially affecting the company.

With regard to the first and second tax increases, it is necessary to determine the exact timing of the announcements (including whether they occurred before or after the market close for the day). Let us assume that PubliCo's share price declined by 30 per cent following the announcement of the first tax increase and by 50 per cent following the announcement of the second tax increase. In the steps that follow, 'excess' share price returns (i.e., the returns after controlling for market and industry movements) associated with these announcements are estimated.

It is important to thoroughly examine the chronology on and around the relevant event dates to determine whether any other news released concurrently could have also affected the price of PubliCo's shares. In the absence of any other factors that would affect PubliCo's share price, one would assume that any statistically significant excess share price returns are attributable to the alleged wrongful acts.

30 Sanjai Bhagat and Roberta Romano, 'Event Studies and the Law: Part I: Technique and Corporate Litigation,' *American Law and Economics Review 4*, No. 1 (January 2002), p. 142.

31 See, for example, *In re Imperial Credit Indus Inc. Sec. Litig.*, No. CV 98-8842 SVW, 2003 WL 1563084 (C.D. Cal.), which granted the defendants' motion for summary judgment on all claims 'because, after viewing the evidence in the light most favorable to Plaintiffs and with all reasonable inferences drawn in favor of Plaintiffs, there is no legally sufficient evidentiary basis for a reasonable jury to find for Plaintiffs as to the existence of loss causation and damages. Plaintiffs' expert report on damages . . . is deficient for failure to provide an "event study" or "similar analysis"'. Also see *In re Executive Telecard Ltd. Sec. Litig.*, 979 F. Supp. 1021 (S.D.N.Y. 1997).

32 David Tabak and Frederick C. Dunbar, 'Materiality and Magnitude: Event Studies in the Courtroom', NERA Working Paper, April 1999, p. 3.

Estimate a market model

An economist would then estimate a regression model (market model) to determine the typical relationship between PubliCo's share price movements and the movements of the market (as proxied by one or more indices: a market index, an industry index or an index of comparable companies). The regression model is ideally estimated over a 'clean period' that is unaffected by the alleged wrongful acts.[33] Alternate model specifications might be examined to determine the one that best explains PubliCo's share price movements.[34] As described below, the market model is used as a control for market and industry movements to isolate the effect of the announcement being studied on share price.

Estimate predicted share price returns

For each event date (here, the first and second tax increases), an economist would need to decide upon the appropriate 'event window' for examination (i.e., the period over which one examines share price movements following the announcement). The event window typically begins immediately before the announcement (e.g., at the end of the previous trading day, if daily price data are used) and concludes within a few days following the announcement.[35]

One would then estimate the predicted returns for PubliCo's shares during each event window, using the market model. First, the returns over each event window of the indices chosen as explanatory variables for the purposes of estimating the market model are observed. To determine a predicted share price (i.e., the price that would be observed if the only factors affecting the price that day were those captured by the indices), those returns are then adjusted to reflect the typical relationship between the returns of the indices and the returns of PubliCo's share price. For example, if the market return was –2.5 per cent on the day the first tax increase was announced, and the coefficient estimate was 2, then one would predict a return of –5 per cent (–2.5 per cent multiplied by 2) for PubliCo on that date.[36]

Estimate excess share price returns on relevant dates and test for statistical significance

The next step is to compare the predicted returns with PubliCo's actual returns in each event window, with the difference representing the abnormal or excess return. As noted above, absent any other company-specific news released concurrently that could have also affected the price of PubliCo's shares, one assumes that any statistically significant excess return is attributable to the alleged wrongful act. This is because the event study procedure controls for price changes attributable to the factors affecting the broad market and the industry.

If there is only a small difference between the actual return and the predicted return in an event window (meaning that the excess return is close to zero), it is likely that the alleged wrongful act announced at that time did not affect the share price. The larger the excess return, the more likely it is that the alleged wrongful act affected the share price. Economists use standards of statistical significance to determine the threshold at which an excess return is

33 See Tabak and Dunbar, pp. 8–10 for further information on selecting the appropriate estimation window.

34 For example, an economist could review regression statistics such as the r-squared.

35 For further information on selecting the appropriate event window, see Tabak and Dunbar, pp. 7–8, and Dmitry Krivin, Robert Patton, Erica Rose, and David Tabak, 'Determination of the Appropriate Event Window Length in Individual Stock Event Studies,' NERA Working Paper, 4 November 2003.

36 For ease of understanding, we assume that the estimated value of the constant in the regression is zero for this calculation.

considered large enough to be attributable to an announcement (i.e., statistically significant).[37] If the observed price movement is statistically significant, one can draw an inference that the alleged wrongful act caused the excess share price return.

For example, recall that PubliCo's share price had a return of –30 per cent following the announcement of the first tax increase. Using the market model, a predicted return of –5 per cent was estimated on that date in the previous step. This would imply an excess return of –25 per cent (the difference between –30 per cent and –5 per cent). If this excess return were determined to be statistically significant, one could infer that this price movement was attributable to the announcement of the first tax increase.

Let us assume, however, that on the same date of the second tax increase there was another announcement by the company earlier in the day (e.g., that the earnings forecast would be revised downwards). This would be considered an example of confounding news or a concurrent event, in which case one would separate the effects of this announcement from the effects of the alleged wrongful act, where possible. There are techniques used to deal with such situations and the manner in which one might do so would depend upon the nature of the announcements and the available data.[38]

Estimate aggregate damages

An economist would treat the two unanticipated tax increases spaced six months apart as separate disclosure events. For each tax increase, the change in share price implied by any statistically significant excess return would be estimated separately. By multiplying by the appropriate number of shares, one can then estimate the effect of each announcement on PubliCo's market capitalisation.

These estimates can form the basis for a damages claim that isolates the impact of the announcements from that of other market and industry factors through use of the event study method. The event study method could be used alone, or to support the results of another method (e.g., a discounted cash flow method). However, if an economist found no statistically significant share price movement following either the first or the second tax increase, these results could potentially be used to dispute a claim for damages.

If PubliCo's parent company HoldCo's shares are publicly traded and trade in a liquid market, an economist could also analyse HoldCo's share price movements following the announcements of the two tax increases. The efficacy of this approach would depend on various factors, including the proportion of HoldCo's profits (or cash flows to equity) that PubliCo contributes.

As both of these examples show, the economic tool of regression analysis can be used to assess causation with respect to claimed damages. Regression analysis can isolate alleged injury resulting from an alleged wrongful act from that caused by other factors (i.e., to show that the causal link is not 'too remote'). Moreover, because regression analysis relies upon empirical data, arbitral tribunals may find the results compelling for the purposes of establishing or refuting 'sufficient certainty'.

37 As noted above, testing for statistical significance involves determining whether the probability that the observed share price movement was owing to chance (rather than the alleged wrongful act) meets or is less than a pre-specified level (e.g., 1 per cent or 5 per cent).

38 See Tabak and Dunbar, p. 11, for further information.

V CONCLUSION

Because of their usefulness in assessing issues of causation, we expect that in the future we will see the increasing use of economic and statistical tools in investment treaty arbitration. The reliance of these methods on empirical data – in contrast with potentially subjective opinion – and their ability to specify a known rate of error will provide arbitral tribunals with important information when considering issues of both factual and legal causation. Ultimately, these tools will allow both claimants and respondents to make a quantitative case for their positions with regard to causation. As one legal academic recently posited, 'Close cooperation between lawyers and economists may lead to more rigorous causation analyses in future.'[39] Our strong belief is that it will.

39 Wolfgang Alschner, 'Aligning Loss and Liability – Toward an Integrated Assessment of Damages in Investment Arbitration', in *The Use of Economics in International Trade and Investment Disputes*, ed. Marion Jansen, Joost Pauwelyn, and Theresa Carpenter, Cambridge, UK: Cambridge University Press, 2017, p. 303.

Appendix 1

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ERIN B MCHUGH

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