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Econometrics In UK Cartel Damage Cases: Why Is It Failing?

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ABSTRACT

Of the four cartel (Article 101 TFEU) damage cases that have gone to full trial in the UK *BritNed v. ABB, Royal Mail & BT v. DAF, Granville v. Chunghwa* and *Stellantis v. Autoliv*) one or both parties' experts gave econometric evidence which was rejected as 'unreliable,' 'biased' and 'unusable' with one exception. In this article, I review the case outcomes, what they reveal about the use and limitations of econometrics, and the guidance they give to economists presenting econometric evidence before the UK courts and the Competition Appeal Tribunal.

KEYWORDS: damages, econometrics, expert evidence, cartel, overcharges

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I. Introduction

Econometrics has become a central feature of UK competition litigation. As the Court of Appeal observed, "[A]lmost all damages claims rest upon some species of regression analysis, but virtually all such modelling suffers from a variety of reliability risks."[1] This preference jars with the failure of econometrics in the courtroom. Of the four cartel damage cases that have gone to full trial to date - *BritNed v. ABB*[2], *Royal Mail & BT v. DAF*[3], *Granville v. Chunghwa*[4] and *Stellantis v. Autoliv*[5] - the econometric evidence was rejected as "unreliable," "biased" and "unusable" in all except *Granville*. This is worrying because of all the areas where econometrics can be applied, the measurement of cartel overcharges is the least controversial and arguably the simplest. In this article, I review the case outcomes, the use and limitations of econometrics, and the guidance that these cases give to economists presenting econometric evidence before the UK courts and the specialist antitrust Competition Appeal Tribunal.

II. The Attraction of Econometrics

Today, no lawyer handling a competition case in the UK would go to court without instructing an economist as an expert. This is particularly so in damage cases where the quantification of overcharges and their pass-on to direct and indirect purchasers is complex and difficult to determine. While economic theory, before-and-after comparisons, margin analysis, and more exotic approaches such as simulations can be used, economists will instinctively seek, where possible, to use an econometric approach.[6]

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[1] *O'Higgins FX Class Representative Ltd v. Barclays Bank plc and Evans v. Barclays Bank plc* [2023] EWCA Civ 876 [114].
[2] *BritNed Development Ltd v.. ABB AB and ABB Ltd* [2018] EWHC 2616 (Ch).
[3] *Royal Mail & BT v. DAF* [2023] CAT 6.
[4] *Granville Technology Group v. Chunghwa Picture Tubes* [2024] EWHC 13 (Comm).
[5] *Stellantis v. Autoliv* [2025] CAT 9.
[6] *Econometrics - Legal, Practical And Technical Issues* (2nd Edn, American Bar Association, 2014); Cento Veljanovski, *Cartel Damages – Principles, Measurement, And Economics* (OUP 2020).

The reason why econometrics is preferred is simple[7]. As the Competition Appeal Tribunal (hereinafter the CAT or Tribunal) observed in *Autoliv*, it is critical to take account of all the factors affecting prices and not to assume that price changes during the infringement period are indicative of the existence of a cartel. This is particularly so given that the four cases discussed below were follow-on actions from "object infringements" under Article 101(1) TFEU (and the equivalent Chapter I prohibition, under section 2 of the UK Competition Act 1998), where the European Commission, not any EU national antitrust authority, is not required to, nor did it, identify or quantify the adverse impact of the respective cartels on competition and prices. The claimants in the four decided cases, even though they relied on relevant Commission decisions to mount their damage actions, found little assistance from the decisions to satisfy the essential requirements of causation and the quantum, which are the gist of a damages claim. This has been exacerbated by the trend for competition authorities to reach settlements with the offending companies, resulting in terse decisions and reduced documentary information in the authorities' files.[8]

Considering this legal lacuna, which is obviously present for standalone actions, the claimant must employ a technique to establish causation and quantify damages. The latter requires the measurement of the value of commerce, the overcharge and pass-on rates, and volume effects. For most of these, econometrics can play a part. It is one of the few approaches that systematically allows for the myriad factors that affect prices to be simultaneously considered using large volumes of historical (transactional) data. It can isolate and quantify the hypothetical otherwise unknown "but for," counterfactual or non-infringement price that would have existed in the absence of the cartel. And it can do this without knowledge of how the overcharges were orchestrated by the defendants, which will often be so

[7] A survey found that up to May 2025, of the 115 cases across the EU, Norway, Switzerland, and the UK in which damages were awarded 18 were based on econometric analysis. Jean-François Laborde, 'Cartel damages actions in Europe: How courts have assessed cartel overcharges (2025 ed.)' (2025) N° 7 Concurrences 2.

[8] Cento Veljanovski, 'An Empirical Analysis of European Cartel Prosecutions 2010 to 2019' (2023) 68 The Antitrust Bulletin 411.

because cartels operate in secrecy, unknown to their "victims". This information asymmetry is not resolved by standard disclosure and evidence unless the defendants are clumsy enough to record their illegal activities.

What is clear from the legal standard for proof is the judicial acceptance that there is considerable uncertainty surrounding the quantification of damages, whether in tort or antitrust. The attraction of econometrics is to reduce this uncertainty. This may seem a self-serving observation by an economist, but the naive criticism that economists disagree and that econometric evidence is rarely decisive misses the point. If it were obvious and easy to quantify damages, then there would be no need for litigation, and because there is litigation, the parties differ as to the existence and amount of the harm. Unless the critics can point to a simple, uncontentious method of quantification, then the field is open to differences. The corollary is that the performance of econometrics at trial may give a distorted view of the extent to which it assists in the settlement because the economists are less likely to disagree. The uncertainty surrounding damages and their effect on the methods used to quantify overcharges is set out succinctly by the Practical Guide[9] drafted as guidance to national courts of the EU:

> "16. It is impossible to know with certainty how a market would have exactly evolved in the absence of the infringement of Article 101 or 103 TFEU. Prices, sales volumes, and profit margins depend on a range of factors and complex, often strategic, interactions between market participants that are not easily estimated. Estimation of the hypothetical non-infringement scenario will thus by definition rely on a number of assumptions. In practice, the unavailability of data will often add to this intrinsic limitation.
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> 17. For these reasons, quantification of harm in competition cases is, by its very nature, subject to considerable limits as to the degree of certainty and precision that can be expected. There cannot be a

[9] European Comm'n, Practical Guide – Quantifying Harm for damages based on breaches of Article 101 or 102 of the Treaty on the Functioning of the European Union (2013/C 3440) ("Practical Guide") .

> single "true" value of the harm suffered that could be determined, but only best estimates relying on assumptions and approximations…"[10]

III. The Legal Standard of Proof

The assessment of econometric evidence must be put in the context of the legal standard of proof applied to damages in English law[11]. To establish causation requires that the but-for test must be satisfied, i.e. evidence of a direct causal link between the impugned conduct and the harm, which is more likely than not. For the quantification of harm, the standard of proof is weaker in recognition of the uncertainties surrounding quantification generally, but particularly in competition cases where measurement of the overcharge is based on hypothetical counterfactuals; namely, what would have been the price in the absence of the impugned conduct. This exercise is much more difficult than that generally faced in commercial litigation because the notions of overcharges and the competitive benchmark are abstract ones with varying interpretations that give rise to numerous counterfactuals. For example, it is frequently and incorrectly stated that the counterfactual is the competitive price, whereas in law, it is the non-infringement price. But whichever counterfactual prices are expressed they are known.

English courts and the CAT take a "pragmatic approach" to quantifying damages as reiterated in *Asda v. Mastercard*:

> "… the assessment of damages will involve an element of estimation and assumption. Restoration by way of compensatory damages is often accomplished by "sound imagination" and a "broad axe" or a "broad brush". The court will not allow an unreasonable insistence on precision to defeat the justice of compensating a claimant for infringement of its rights …"[12]

[10] Cited approvingly in *BritNed* (n 2) [12].
[11] I use the term English law to represent the law of England and Wales and to distinguish it from the laws of the other nations that make up the United Kingdom, i.e. Scottish and Northern Ireland. The Competition Act 1998, other competition legislation, and the jurisdiction of the Competition Appeal Tribunal are UK-wide.
[12] *Asda Stores Ltd v. Mastercard Inc* [2017] EWHC 93 (Comm) 306 [12].

The "broad axe", "broad brush" and "sound imagination" metaphors come from Lord Shaw's House of Lords' (the then supreme court of England) judgment in the *Watson Laidlaw*[13]. They have been reiterated in antitrust cases[14] and expressly applied to the use of econometrics by the CAT in *Royal Mail*:

> This "broad axe" approach, largely based on expert econometric evidence, is necessary to accommodate the difficulties of proof inherent in the quantification of competition law damages. It is also required by the principle of effectiveness and the overriding objective that cases should be dealt with proportionately … [15]

His Honour Judge Pelling in *Granville* (discussed below) said that "The reason for preferring multiple regression analyses is to reduce the area of uncertainty that the broad brush approach has to address"[16]. HH Judge Pelling's judgment has thrown econometrics a legal lifeline: "… multiple regression analysis … offers the possibility of addressing reality rather than making theorised assumptions"[17].

Another issue, more to do with the law than economics, is the legal presumption underpinning follow-on damage actions. The Court of Appeal in *Royal Mail* held that the CAT was entitled to assume that there was an overcharge because an infringement by object implied that "it is very likely to have had negative effects on transaction prices." It went on to say that "even though in an object case there is no duty on the Commission to go on and make findings about actual effects".[18] In practice, it never does. This caveat effectively negates the presumption of harm. The

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[13] *Watson Laidlaw & Co Ltd v. Pott, Cassels & Williamson* [1914] SC (HL) (18).
[14] *Sainsbury's Supermarkets Ltd v. Mastercard Incorporated* [2020] UKSC 24 [218]; *Dawsongroup plc v. DAF Trucks NV* [2020] CAT 3 [40(3)]; *BritNed* (n 2).
[15] *Royal Mail* (n 3) [174].
[16] *Granville* (n 4) [84].
[17] Ibid. [77].
[18] *BritNed* (n 2) [142] citing *O'Higgins* (n 1) [25]-[32]. In the landmark cement judgment the CJEU observed: "In most cases, the existence of an anti-competitive practice or agreement must be inferred from a number of coincidences and indicia which, taken together, may in the absence of another plausible explanation, constitute evidence of an infringement of the competition rules" Cases C-204/00P etc *Aalborg Portland v. Commission EU: C:2004:6* [57].

evidential basis of an infringement by object is documentary evidence of coordination, such as meetings, emails, etc, discussing prices and the other terms of trade. The European Commission is under no legal requirement to identify, let alone quantify, the adverse effects on competition and prices.

The same issue arises with the rebuttable presumption of harm in Article 17.2 of the EU Damages Directive.[19] As Sir Marcus Smith J tersely observed in *BritNed*: "I fail to see how a bare presumption of harm - particularly one, which does not involve a presumed quantification of harm—takes matters any further at all."[20] In practice, the presumption of harm is formalistic as the claimant must still "prove" causation and loss. As the law stands, the default level of harm is zero.

IV. Overview of Cartel Damages Cases

Under UK law, all those harmed have the right to claim compensation for a breach of competition law. This right has existed since the inception of European antitrust, but for decades has remained relatively unused. Even with clarification of the right to sue in *Garden Cottage*[21] in 1983 and two decades later by European courts, in *Crehan*[22] competition damage claims were relatively few. The impetus for litigation has come from the EU Damages Directive[23] in 2014, which sought to harmonise European member state national laws, and in the UK, the Consumer Rights Act 2015,[24] which established a new collective (class) action regime. Since then, there have only been five successful Article 101 TFEU judgments[25]. It is fair to say

[19] Damages Directive 2014/104/EU implemented as UK Competition Act 1998 s47F and Schedule 8A. The Directive was designed to harmonise claims for antitrust damages across the European Union.
[20] *BritNed* (n. 2) [23(5)].
[21] *Garden Cottage Foods v. Milk Marketing Board* [1983] AC 130.
[22] Case C-453/99 *Courage Ltd v. Crehan* [2001] ECR I-6297.
[23] Directive 2014/104/EU (26 November 2014). Implemented in UK Competition Act 1998 s 47F and Schedule 8A.
[24] Amending Competition Act 1998 ss 47 B & C (introducing new opt-out collective actions awarding 'aggregate damages').
[25] Apart from the four cartel damage judgments discussed in the text the only other successful Article 101 TFEU action was CAT *Sainsbury's* (n. 26) (damages of £68 million). Before the Damages Directive there were only three successful Article 102 TFEU (abuse of dominance) claims awarding relatively small damages: *Healthcare at Home v. Genzyme Ltd* [2006] CAT 29 (interim damages of £2 million); *2 Travel Group PLC (in liquidation) v Cardiff City*

that the UK courts and CAT are feeling their way and evolving their approach to damage cases and economic evidence.

To date, there have only been four decided cartel damage cases. Table 1 summarises some key facts and the performance of econometrics in dealing with the quantification of the overcharges. These cases cover damage claims arising from international or pan-European cartels – the power cables, trucks, LCD panels and automobile occupant safety systems (airbags, steering wheels, seatbelts). All four were follow-up actions from a European Commission prosecution.

TABLE 1: SUMMARY OF JUDGMENTS

Case	**Year**	**Product/cartel**	**Overcharge/ damages**	**Approaches**
BritNed	2018	Power Cables	0% overcharge 2.6% baked inefficiencies 1.9% common cost savings (rejected on appeal)	econometrics (C) gross margins (D) Cost-based damages assessed by judge
Royal Mail	2023	Trucks (10.000 trucks)	5% (broad axe)	Econometrics (C&D) rejected
Granville	2024	LCD panels: TV PC monitors Notebooks	 14% 8% 4%	trend analysis (C) rejected econometrics (D) accepted
Autoliv	2025	OSS products: seatbelts steering wheels airbags	 0% 0% 0%	econometrics (C)

In all these cases, one or both experts used a single price regression equation where prices were regressed on several variables which were considered by the expert to have affected prices. This is a temporal comparative approach where the cartel is represented by the infringement period using a binary variable which takes the value of 1 for the months or years of the period of the infringement, using

Transport Services Limited [2012] CAT 19 (damages of £33,817*); Albion Water Limited v Dwr Cymru Cyfyngedig* [2013] CAT 6 (damages of £1.7 million).

data either during-and-after, or before-during-and / or after the infringement period. This dummy variable approach captures the shift in prices during the infringement period after adjusting for the other factors (variables) assumed to affect prices that the expert has been able to include in the regression.[26]

Not all economists in these cases relied on econometric analysis. The claimants' experts generally did, but their evidence was successfully challenged by the defendant's expert (*Royal Mail*, *BritNed*, *Autoliv*). The experts also used other approaches – in *BritNed* the defendants' economist relied on a comparison of gross margins; in *Granville,* the claimants' expert used trend price analysis.

V. How the Econometrics Performed at Trial

It is easy to pinpoint the reasons why the econometrics failed in each of the three decided cases because the judgments tell us. But by looking at the reasons, we gain insights into the limitations of econometrics both as a technique and in law.

A. *BritNed Development v. ABB*

In *BritNed,* the first UK case to award damages for cartel overcharge damages, the use of econometrics was considered inappropriate. The Claimant's expert applied econometrics to a small sample to estimate the overcharge for an individual tender. The judge found the claimant's econometrics "too complex," "unspecific,"[27] and "one on which I can place no weight and reject as evidence."[28]

BritNed is a follow-on damages action based on the European Commission's *Power Cables* decision.[29] This found that the defendant ABB was a member of a global bid rigging cartel tendering for the supply of extra high voltage submarine power cable projects during the period 1999 to 2009. ABB successfully bid to supply a submarine cable to BritNed's electricity interconnection project between the UK and the Netherlands. The claimant used

[26] See generally, Veljanovski (n. 6)
[27] *BrtiNed* (n 2) [416].
[28] Ibid. [417].
[29] Case AT.39610 - Power Cables, Comm'n Decision (2 May 2014).

econometrics to estimate an overcharge of around 22%, claiming damages of €61.3 million.

The claimant's econometric evidence consisted of a single during-and-after price regression. The data consisted of 92 ABB submarine and underground cable projects for the period 2001 to 2016, which did not cover the first two years of the infringement period. The cartel effect on the contract values was captured by a dummy variable in a regression which controlled for costs, the difference between underground and submarine cable projects, a demand variable, and a time trend.

The court looked closely at the claimant's econometric evidence. It was successfully challenged as being fraught with small sample statistical problems, not robust and unsupported by the documentary evidence[30].

The initial small sample led to a large standard error for the cartel dummy. It lacked what statisticians called "precision", as reflected in the large standard error and wide confidence interval. The estimated mean overcharge was 22% with a 95% chance that the true value lay between 0.32% and 39%, implying overcharge damages of anywhere between €885,000 to €108.7 million. This "shocked" the judge, who concluded that this was "an indicator that the model is not producing useful outcomes such that I can rely upon."[31]

The sensitivity tests, which are now obligatory in any expert report, indicated that the claimant's regressions were not robust. These involved excluding, in turn and separately, cartel projects other than the BritNed project, underground cable projects, the time trend and "order backlog" variable used as a measure for demand conditions facing ABB. With one exception, these reduced the

[30] Cento Veljanovski, 'The UK High Court of Justice rejects econometric analysis in a cartel damage case as being too complex (BritNed/ABB)' (2019) e-Competitions Bulletin Art. N° 91989.

[31] There were also concerns about the claimant's expert decision not to use ABB's actual costs because they were likely inflated by the existence of the cartel. If correct, actual project costs would have been endogenous. To deal with this, ABB's copper and aluminium input prices were used as a proxy for ABB's project costs, which the court rejected as these were, in the judge's opinion, "insufficiently aligned with the highly individual costs of individual submarine cable projects". Yet the judge went on to find that ABB's costs were inflated because of the defendant's use of thicker cables, giving the claimant damages based on the excess costs.

estimated overcharge and rendered it statistically insignificant. This by itself was not a matter for concern. As the judge commented: "If the parameters are material … their removal from the model will make a difference."[32]

The sensitivity tests set in train questions which undermined the probative value of the econometrics. For example, excluding underground cable projects from the data halved the sample size, increased the overcharge to 27.7%, though statistically insignificant, and altered the coefficients of several control variables, rendering the time trend insignificant. The "overcharge" coefficient should not have altered much as it did if underground and submarine cable projects were sufficiently similar. The court concluded that the wrong sample had been used as underground projects were fundamentally different to submarine projects, which, when corrected, showed no evidence of a statistically significant overcharge.

The killer blows to the Claimant's econometrics came from elsewhere.

First, the judge said, "the fragility of the model is in large measure hidden by … [the] use of averages."[33] The claimant's econometric model estimated an average 22% overcharge over all the projects "to compute the overcharge on the BritNed project". When the model's parameters were applied to individual submarine projects, it generated widely different predicted overcharges – some small, some negative and others massive. As the judge commented, "given the bespoke and unique nature of these projects, I find that an overcharge calculated by a model that is explicitly averaging across multiple projects to be an inappropriate one".[34] This was a valid criticism given the highly differentiated nature of ABB's projects.

Secondly, the judge said that there was no evidence of an overcharge because those putting together the ABB tender were unaware of the cartel and had priced it along competitive lines. Here the curt relied on the witness statements of the those employed by the defendant.

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[32] *BritNed* (n 2) [379] (emphasis in original).
[33] Ibid. [418].
[34] Ibid. [421].

Thirdly, the Defendant's expert's comparison of gross profit margins during and after the infringement showed that they were similar, which the judge accepted as further evidence that there was no overcharge.

Notwithstanding the finding that there was no overcharge, the judge went on to award two novel heads of cost-based damages amounting to €13 million, later reduced to €11 million on appeal for so-called "baked-in inefficiencies" and "common costs savings" - the latter rejected on appeal as an "error of law" and inconsistent with compensatory principles.[35]

The presiding judge, Sir Marcus Smith J, went on to publish a widely read article discussing the evidential difficulties (he had) with econometric evidence based on his experience in *BritNed*.[36]

B. *Royal Mail & British Telecom v. DAF*

Royal Mail was a follow-on action arising from the European Commission's trucks settlement decision[37] and the later Scania infringement decision[38]. It is a landmark decision dealing with unresolved matters of law and is a precedent for the many claims against the European truck manufacturers.

The Commission found the European truck manufacturers - DAF, Daimler, Iveco, Volvo, MAN and Scania - exchange information on the gross list prices of "medium trucks" (6 to 16 tonnes) and "heavy trucks" (greater than 16 tonnes) across EEA over 14 years from 1997 to 2011, and had agreed to delay introduction of emission technologies need to comply with European emissions standards (from Euro III to applicable Euro VI) and on the timing for the pass-on of the costs of complying with these emissions' standards.

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[35] *BritNed Development Limited v. ABB AB & ABB Ltd* [2019] EWCA Civ 1840 (Damages for baked-in inefficiencies were not appealed but would have, in my view, been rejected by the Court of Appeal). See Cento Veljanovski, 'Damages for Bid-rigging - The English High Court's idiosyncratic cost-based approach in BritNed' (2019) 10 J. Eur. Comp. Law & Practice 109.

[36] Sir Marcus Smith, 'Lawyers come from Mars, and economists come from Venus – Or is it the other way around? Some thoughts on expert economic evidence in competition cases' (2019) 18 Comp. L J 1 .

[37] Case AT.39824 – Trucks, Comm'n Decision (19 July 2016).

[38] Case AT.39824 – Trucks, Comm'n Decision (27 September 2017).

The Tribunal received 48 expert reports running to thousands of pages, which it regarded as "excessive" and "highly burdensome". The trial was the culmination of six years of litigation. It lasted 25 days, with six days spent on factual witnesses, 12 days on expert evidence, including the "hot tubbing" of the experts, and seven days on oral submissions. The Claimants and Defendant jointly expended around £20 million in legal and experts' fees, more than the amount awarded by the Tribunal in overcharge damages, excluding interest.

In *Royal Mail,* the defendant's expert found that the cartel had been ineffective in raising truck prices; the Claimants' expert said the overcharges were between 6.7% and 14.7%, depending on the timeframe and truck type, both using multiple regression analysis. The Tribunal found the regression analyses underpinning these estimates were "not fully reliable and unbiased". It awarded the claimants a 5% overcharge using the broad axe on about 10,000 trucks purchased over 14 years, amounting to damages of about £38 million (including interest), which was half the damages sought.[39]

The CAT found that the experts had selected the econometric results that favoured "the commercial interests of their client." Both experts were criticised for their lack of independence and unwillingness to concede legitimate differences. The defendant's expert, said the Tribunal, was "prepared to dismiss such evidence if it did not fit with his empirical analyses." The Tribunal did not regard the econometrics as "futile", it gave "insights" that better informed its views on the overcharge.

The experts adopt different regression models. The Claimant's expert used two models – a before-and-after for truck prices between 1995 and 2003, and a during-and-after for truck prices between 2004 and 2017; the defendant used a before-during-and-after model. As the data was less granular for the early period, the before-and-during specification was not robust, while the CAT felt that

[39] *Royal Mail Group & BT Group v. DAF Trucks* [2024] EWCA Civ 181 [147] ("CA *Royal Mail*"): "the CAT did not simply split the difference […], but in the section of its judgment setting out its Conclusions on Overcharge at [475] to [486] it made positive and reasoned findings as to the appropriate quantification of the overcharge."(It is correct that the Tribunal did decide which approach of the experts to the three contentious differences was the better.)

during-and-after model possibly underestimated the overcharge because of a price "overhang effect" (more commonly called the run-on period; or in the *Granville* judgment "price persistence") as higher cartelised prices continued after the end of the cartel as state in the competition authority decision.

The experts' econometric analyses differed on three "technical issues" – the treatment of exchange rates, the global financial crisis (GFC) and emission technologies.

The transactions were in multiple currencies, which had to be reduced to a single currency. The claimant's expert converted all prices and costs to euros; the defendant used pounds Sterling. This was a material consideration as during the early part of the infringement period (1996 to 1998) the pound appreciated against the euro, which would have increased euro-denominated truck prices. The choice of which exchange rate gives rise to what economists call an 'identification problem' because by combining foreign exchange and the cartel price effects, it would not be clear whether the cartel dummy was picking up the overcharge or the changing value of the pound.

The second technical issue was how to take account of the GFC. The defendant's expert argued that the demand variables already included in the regression equation were adequate to reflect the downturn in demand caused by the GFC. The claimant's expert argued that the GFC was an extraordinary event which affected demand in a more pronounced way than would be picked up by fluctuations in the demand variable and therefore added a separate dummy variable to capture the effects of the GFC on truck prices.

The third technical issue was the treatment of the timing and passing on of the capital costs of complying with the Euro 3, 4 and 5 emissions standards. The infringement included the actions of the defendants to delay the introduction of these emission technologies and to agree on when the costs should be passed on. The differences surrounding this issue boiled down to arguments about omitted variable bias, i.e. the bias introduced into the regression coefficient because one or more significant variables are not included in the regression analysis.

C. *Stellantis v. Autoliv*

Autoliv was not a follow-on action but drew heavily on two European Commission automobile occupation safety system (OSS1[40] and OSS2[41]) decisions, which identified six cartels operating over different periods supplying specific car manufacturers with airbags, seatbelts and steering wheels. Autoliv was not identified in the Commission's decisions as affected by any cartel. Nonetheless, the claimant argued that the cartel would have affected the prices that Autoliv charged during and well before the infringement period set out in the OSS decisions. pleading in the alternative, a direct effect or an umbrella effect[42]. The claimant's expert estimated overcharges of 10% up to 26%, separately for steering wheels, airbags and seatbelts, giving a total damage claim of €770m.

The Claimant's expert used econometrics to prove both the existence of the cartel and its harm. He failed on both counts.[43] The Tribunal found the regressions "unreliable" and "unusable." The Tribunal said the claimant's econometric modelling suffered from omitted variable bias[44], inconsistent model specifications, weak sensitivity testing, and the reverse-engineering of the seatbelt regression.

The Tribunal accused the claimant's economist of "data mining" to get the results that favoured his client. It found that the claimant's seatbelt regression suffered from omitted variable bias. The expert used the Commission's OSS decisions to identify the "Main Period" using the infringement dates in the Commission decisions for the operation of each cartel, and an "Early Period" based on his interpretation of the disclosed documentary evidence. Both these periods were used for his airbags and steering wheel regressions, but for his seat belt regression, only the

[40] Case AT.39881 - Occupant Safety Systems supplied to Japanese Car Manufacturers Comm'n Decision (22 November 2017).
[41] Case AT.40481 – Occupant Safety Systems (II) supplied to the Volkswagen Group and the BMW Group, Comm'n Decision (5 March 2019).
[42] An umbrella claim makes the cartel members jointly and severally liable for the uplift in prices by firms outside the cartel that can be causally linked to the cartel's overcharges.
[43] The claimants have been given leave to appeal the CAT's judgment.
[44] Omitted variable bias is where there is an omitted variable which is a determinant of the dependent variable and is correlated with a regressor, which causes the latter to be a biased estimator.

Main Period. It emerged at the trial that the expert had rejected the two-period approach for seatbelts because the regression estimated a large and statistically significant undercharge. As the expert explained at trial: "For seatbelts, my initial analysis indicates prices were lower during the Early Period, suggesting that the Cartel's impact began around the start of the Main Period. Consequently, the estimates I present exclude the Early cartel period variables"[45].

The Tribunal roundly criticised his approach: "There is no basis in the theory of harm being advanced, or within the documentary and witness evidence, for the application of different tests for the different categories of OSS"[46]. It went on to say that the existence of large and statistically significant undercharges for seatbelts "must be explained by other factors that are not included in the model"[47]. The expert, it said, "had allowed his views that an overcharge is likely in the case of seatbelts to cause him to recast his model". He had worked back from the "desired results." This said the Tribunal was a "clear example of an inappropriate application of an econometric analysis."[48]:

> "For an econometric test of this type to provide reliable results, it is essential that the test be formulated in advance in the light of a particular hypothesis (theory of harm) and be used to test that hypothesis. It is not appropriate to reformulate the hypothesis to fit the data."

While omitted variable bias was given as the reason for rejecting the claimants' regressions[49], it was bolstered by the instability of the regression results when different time periods were used. As can be seen from Table 2, the dummy variables representing the different cartel periods caused the overcharge coefficients to gyrate from very high positive and negative values to small statistically insignificant values. But when the periods were combined,

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[45] *Autoliv* (n 5) [189].
[46] Ibid. [202].
[47] Ibid. [204].
[48] Ibid. [234].
[49] Tribunal stressed that "taken in isolation, the question of omitted costs would not be sufficient to undermine, materially, the Hughes Model" (ibid. [198]) but then said that the regressions were "seriously compromised by the omitted variable problem and for this reason we are not able to place reliance upon it to conclude that prices were higher as a result of cartel activity." (ibid. [206]).

the overcharge estimate for airbags fell dramatically from 25% and 10% respectively for the separate periods to a statistically insignificant 1.9%, while for all sensitivities for the Main Period in the seatbelt regressions showed an undercharge which when a single dummy variable was used fell dramatically to a statistically insignificant undercharge of -1.1%. As the Tribunal commented, the "seemingly innocuous decision of splitting the period into two has a large effect and there is no basis to choose between it and a single cartel dummy", so that "we are left with a model that is so unreliable in its outputs that it is unusable." Put more euphemistically, the expert "cherry-picked" favourable dates for the cartel periods to achieve a positive overcharge for seatbelts.

TABLE 2: CARTEL DUMMY COEFFICIENTS FOR EARLY, MAIN AND COMBINED PERIODS.

	Metric	Airbags	Seatbelts		Steering Wheels
Full Period specification			Original	Two-period	
Early Period	Coefficient (Standard error) Overcharge	0.293*** (0.059) **25.4%**	No claim	-0.419*** (0.076) **-52.0%**	0.300*** (0.068) **25.9%**
Main Period	Coefficient (Standard error) Overcharge	0.111*** (0.041) **10.5%**	0.163*** (0.049) **15.0%**	-0.145** (0.061) **-15.6%.**	0.252*** (0.079) **22.3%**
Single Dummy specification					
Combined Period	Coefficient (Standard error) Overcharge	0.019 (0.046) **1.6%**	-0.011 (0.068) **-1.1%**		0.304*** (0.058) **26.2%**

Source: Data taken from Table 1 and Table 3 of the *Autoliv* judgment

The *Autoliv* is interesting in another regard. Somewhat surprisingly, the court accepted the defendant's expert's criticisms even though he did not file his own econometric evidence. He simply and successfully criticised the robustness of the claimants' regression analysis. This was a risky strategy and not generally recommended. This was doubly odd since the defendant opposed and appealed the CAT's decision to have the (then) three defendants (PSA, VO and FCA), which became part of the Stellantis group during the Infringement, share a single expert. This was to avoid the Tribunal having to assess three different expert reports from the defendant and to resolve six sets of disputes.[50] The defendants argued that they should be allowed to have three experts. The Defendants lost the appeal.[51] By the time the appeal had been heard, the claimant's expert had exchanged his (first) expert report, the defendant's expert decided (giving no explanation to the Tribunal) not to undertake his own regression analysis but to criticise the claimants' econometrics. The Tribunal saw no reason why this change in strategy undermined the defendant's expert's evidence, and it proved effective in getting the Tribunal to reject the claimants' evidence and claim.

The Tribunal also rejected the claimant's econometric evidence because it used the regression results for the one claimant (PSA), which supplied the data, as a proxy for the overcharges for the two other claimant groups (VO and FCA). The Tribunal said, "to measure losses in one business and transpose them to another unconnected business, is not a measure of damage: there comes a point at which the broad axe becomes a mallet."[52] This seemed harsh and very much at odds with the pragmatic approach of the Tribunal. It contradicts the way the Tribunal handles multi-party damages actions, where a lead claimant is designated to give evidence which applies to the claims of those in the relevant grouping.[53]

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[50] Under Rule 4 of the Competition Appeal Tribunal Rules 2015, the Tribunal has the power to appoint a single expert for multiple claimants and/or multiple defendants "to ensure that each case is dealt with justly and at proportionate cost".

[51] *Stellantis & Ors v. Autoliv & Ors* [2024] EWCA Civ 609.

[52] *Autoliv* (n 5) [231].

[53] This is the way thousands of claims are being tried by issue and lead claimant groups and single lead expert for each issues (overcharge, and various separate

D. *Granville Technology Group v Chunghwa Picture Tubes*

Granville is a follow-on action based on the European Commission Liquid Crystal Display (LCD) infringement decision, which fined six producers of LCD panels for operating a European cartel during the period October 2001 to February 2006.[54] Anti-competitive practices included price fixing through agreements on future prices, price ranges and minimum prices, future production planning and capacity utilisation, and the exchange of information on pricing and other commercial aspects, including sales volumes or capacity plans.

The LCD panel cartel posed a challenge, as over the infringement period, LCD panel prices experienced a secular and dramatic decline (see Figure 1). This, paradoxically, was due to increased competition from China, overcapacity in the industry, together with serial product innovation that drove down production costs and prices. To arrest the decline in prices, the industry colluded over LCD panels for IT and TV applications (not smaller than 12"). The cartel members held monthly meetings, and in total, they met around 60 times, mainly in hotels in Taiwan for so-called "Crystal meetings".

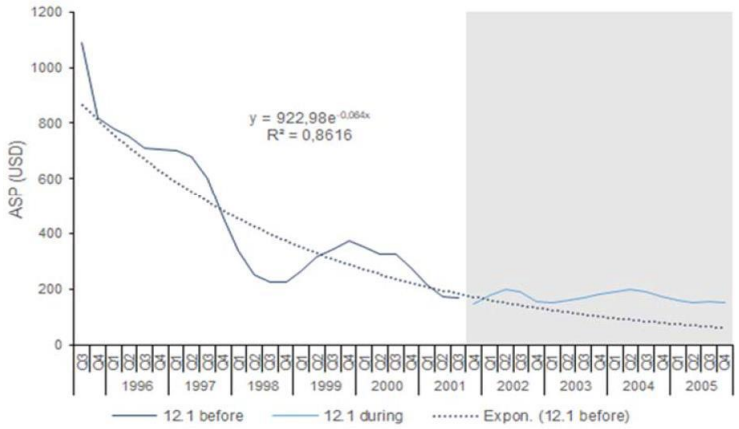
The claimant's expert sought to establish an overcharge of 74% using a simple trend analysis. The expert took the downward trend in LCD panel prices before the start of the infringement and extrapolated this over the infringement period to show that the rate of decline in prices had slowed. He then took the difference in actual and projected prices as the measure of the overcharge. This can be seen from Figure 1 of the judgment for 12.1" LCD panels. The dotted curvilinear line shows the trend in average selling prices (ASPs) before the start of the infringement, which he extrapolated over the infringement period (as shaded in Figure 1). The solid line are actual prices, and the difference between the solid (blue) and dotted line purports to be a measure of the overcharge. To arrive at the 74% average overcharge, the expert added the estimated

pass-on issues down the supply chain)in the Wave 2 trucks litigation in the CAT. See, CAT Ruling (Future Conduct of Proceedings) (9 January 2024).

[54] Case COMP/39.309 – LCD (Liquid Crystal Displays) Comm'n Decision (8 December 2010).

quarterly overcharges together and divided by the number of quarters.

FIGURE 1: LCD 12.1" PANEL ACTUAL AND PROJECTED ASP



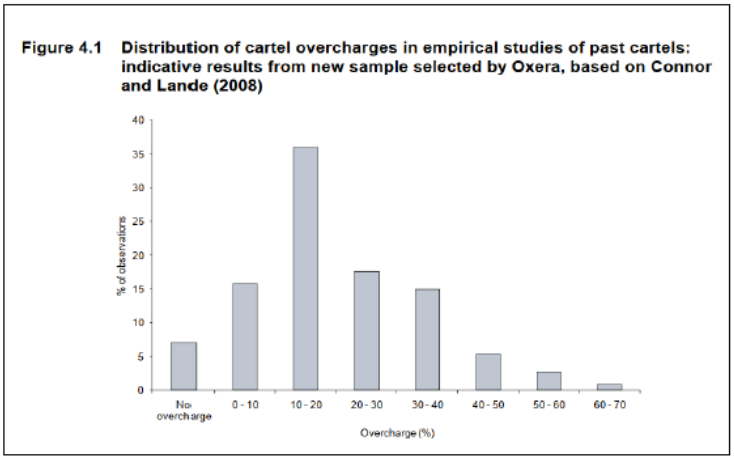
The judge rejected the claimants' expert's trendline extrapolation because it failed to control for changes in production costs, production capacity and demand over the infringement period. Moreover, the approach was sensitive to the pre-infringement period chosen to establish the trendline and, for some periods, produced negative overcharges. While the EC Practical Guide lists such "simple techniques" as appropriate, they are not advised "unless one can adjust for other factors"[55], noting that this "can be done in a more sophisticated way using regression analyses".[56]

The claimant's expert sought to support his very high overcharge percentage by reference to historical estimates of cartel overcharges referred to in the EC Practical Guidelines (Figure 2 which reproduces Figure 4.1 of the Guidelines). This shows median overcharges of around 20% but with a relatively wide distribution[57]. This is given and accepted as evidence of overcharge estimates in many cartel damage cases in other jurisdictions. However, the

[55] Practical Guide (n 9) [67].
[56] Ibid. [62].
[57] These are a sample of published largely academic studies of 114 of a variety of national, internation, bid rigging and other illegal and legal cartels in the US, Canada, Europe and other regions based on Towards non-binding guidance for courts - study prepared for the European Commission Oxera, December 2009) [142]; John M. Connor & Richard H. Lande, Cartel 'Overcharges and Optimal Cartel Fines, 2203–18' in S. W. Waller, ed, *Issues in Competition Law and Policy, Vol. 3* (ABA 2008).

judge said it was "wrong in principle to use historical data derived from other findings by other courts and economic studies about other cartels concerning other industries or industrial sectors to prove or assist in answering the empirical question concerning the level of Overcharge in this case[58]." Further, the claimants' estimate of a 70% overcharge was orders of magnitude higher than 20%.

FIGURE 2 DISTRIBUTION OF CARTEL OVERCHARGES IN EC PRACTICAL GUIDE



The defendant's regression analysis was preferred because it took account of changes in production costs, production capacity and demand over the infringement period. The judge addressed the issue of omitted variable bias and endogeneity but saw these as not affecting his econometric results.[59] The judge's main concern, which is addressed elsewhere in this article, was the possibility that the overcharge had persisted for some time after the end date of the infringement period as stated in the Commission decision. To take account of the possibility of post-infringement "price persistence" the judge added a small uplift to the defendant's overcharge percentages using the 'broad brush' to arrive at overcharges of 14% for TV, 8% for PC monitor and 4% for notebook LCD panels.

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[58] *Granville* (n 4) [59].

[59] Case COMP/39.309 – LCD (Liquid Crystal Displays), Comm'n Decision (8 December 2010). One of the addressees (cartelists) submitted an econometric analysis, purporting to show that the cartel had no effect on prices. The Commission (at recital 415) comprehensively rejected the econometric evidence as "unconvincing for reasons relating to an endogeneity bias, an omitted variable bias, a selection bias because of a sensitivity to groupings, a wrong specification selection and a change in data underlying the methodology during the observation period."

Granville is surprising in another respect, as it was the defendant's expert who "proved" that his client had fixed prices. However, based largely on theory, he managed to convince the judge that a large proportion (65%) of the overcharge had been passed onto the claimants' customers, thus more than halving the net overcharge percentage as final damages.

VI. Was It the Court or the Economist?

Here, I consider two preliminary but critical issues surrounding the failure of econometrics: was the rejection of econometrics due to the judge / Tribunal or the experts?

A. Competence of the Court and Tribunal

Any suggestion that the failure of econometrics is because judges find statistical evidence hard to evaluate is easily rejected. The English courts have not been bamboozled by technical econometric evidence in antitrust cases.[60] As I have discussed for all four judgments, the judge / Tribunal engaged with the experts over the technical features of their evidence and formed considered and credible evaluations of the statistical differences[61]. As Sir Marcus Smith J declared when faced with regression analysis, "judges do not shrink in terror but stare the material boldly in the face and deal with it."[62] This is a major change when in 1999 Ferris J in the Restrictive Practices Court rejected the regression analysis, saying, "this is all washing over my head" in favour of the more common-sense approach of the opposing expert.[63]

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[60] Richard A. Posner,' The Law and Economics of the Economic Expert Witness' (1999) 13 J. Econ. Perspectives 91, 96 ("Econometrics is such a difficult subject that it is unrealistic to expect the average judge or juror to be able to understand all the criticisms of an econometric study, no matter how skilful the econometrician is in explaining a study to a lay audience."). There are no juries in UK civil actions apart from defamation trials.

[61] Tribunal's certification judgment accepting "hedonic pricing" regressions in *Consumers' Association v. Qualcomm Incorporated* Case No: 1382/7/7/21 (2022) [62]-[66].

[62] Smith (n 37) p. 5.

[63] *In the matter of an agreement between the Football Association Premier League Ltd and the Football Association Ltd & the Football League Ltd & their respective member clubs: in the matter of an agreement relating to the supply of services facilitating the broadcasting on television of premier league football matches & the supply of services consisting in the broadcasting on television of such matches*, Judgment 27 August 1999 [2000] E.M.L.R. 78 RPC.

Today, judges are assisted by 'best practice' guidelines issued by competition authorities on the submission of economic and statistical evidence [64]. These were quoted extensively in *Tobacco Packaging*[65] where the court said: "The [CMA] guidance is relevant to the [econometric] analysis which arises in the present case since it sets out how such evidence should be prepared and tendered in order to achieve maximum probative value." The decisions will typically reference to Practical Guide[66] and EC Pass on Guidelines[67] drafted to assist national courts with the quantification of antitrust damages.

There is a further reason. Most cases today are brought before the Competition Appeal Tribunal, which is a specialised competition law tribunal sitting as a panel of three, with one member usually an economist. In *Royal Mail,* one of the ordinary members was a respected competition economist with direct experience presenting econometric evidence in litigation. In *Autoliv,* the member who led the Tribunal's questioning of the experts was Anthony Neuberger, professor emeritus of finance, previous Head of the Finance Faculty, Bayes Business School, who, based on his publications, is well-versed in high-level econometric analyses.[68] However, as I show later, there appears to be little difference in the quality of analyses between a single High Court judge and the specialist panel of the CAT.

In short, the failure of econometrics cannot be laid at the feet of the courts or tribunals.

B. WAS IT THE EXPERT?

In each case where the econometrics evidence was treated as "unreliable," the expert was criticised for his/her failure

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[64] Practical Guide (n 9). Also, DG Competition, Best Practices for the Submission of Economic Evidence and Data Collection in Cases Concerning the Application of Articles 101 and 102 TFEU and in Merger Cases, 6 January 2010. Competition Commission, Suggested Best Practice for Submission of Technical Economic Analysis from Parties to the Competition Commission, CC2com3, 24 February 2009.

[65] *BAT & Ors v Secretary of State for Health* [2016] EWHC 1169 (Admin) [326]-[329]. ("*Tobacco Packaging*").

[66] European Comm'n, Guidelines for national courts on how to estimate the share of overcharge which was passed on to the indirect purchaser (2019/C 267/07).

[67] Tobacco Packaging (n 66) [325].

[68] See M. Britten-Jones, A. Neuberger & I. Nolte 'Improved Inference in Regression with Overlapping Observations' (2011). 38 J. Bus. Fi. & Acc. 657

in their duty to the court to give independent and unbiased evidence. In *Royal Mail,* all the experts were said to have acted in the commercial interest of their respective clients and were admonished for refusing to acknowledge legitimate differences:

> "… we consider that there should have been more recognition, on certain issues, of the scope for a range of possible results and of the reasonableness of the other expert's opinion. As they are aware, the experts' primary duty is to assist us in understanding the factors behind their differing conclusions rather than defending the conclusions which favoured their respective clients' positions".

Most of the Tribunal's ire was directed at DAF's economist. He undermined his credibility by giving a full-blown defence of the DAF in his plausibility statement, which set out his theory of harm.[69] The Tribunal regarded this as detached from reality, made up and implausible. This was surprising since he is a respected academic economist, previously the Chief Economist at the European Commission, who, during his tenure, oversaw the Commission's Staff Paper on best practices for the submission of economic evidence and data analysis[70] and prior to that had published an academic article in which he had highlighted the problems with and solutions to ensuring reliable economic evidence, drawing attention to the European Commission's "tendency toward extremism" "by suppressing evidence or failing to fully consider some alternatives".[71] Yet despite the criticism which damaged the expert's credibility, his technical econometric analysis was evaluated on its own terms, as was that of the other experts,

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[69] CA *Royal Mail* (n 39) [146]: ("Although it (the CAT) was highly critical of Professor Neven … it did not reject his evidence outright but adopted a balanced approach, giving his evidence credence and weight when it thought it proper to do so.")

[70] DG Competition, Best Practices for the Submission of Economic Evidence and Data Collection in Cases Concerning the Application of Articles 101 and 102 TFEU and in Merger Cases, 6 January 2010. See Compass Lexecon biographical notes https://www.compasslexecon.com/professionals/damien-j-neven/ ("He was closely involved in … the adoption of … the Guidelines on the Submission and Evaluation of Economic evidence, which sets a framework and standards for the development of economic analysis in all cases.").

[71] Damien J. Neven 'Competition Economics and Antitrust in Europe' (2006) 21 Econ. Pol'y 742.

where the court or Tribunal has questioned their independence.

It is also the case that economists have been key to undermining the econometric evidence. In all instances, it is the opposing economist who challenges the claimant's econometric evidence by highlighting technical problems. In *BritNed* and *Autoliv,* the respective defendants' economists helped to shoot down the Claimant's expert's econometrics by pointing to its legitimate flaws. And they did this by eschewing econometrics - in *BritNet* the Defendant's expert used gross margin comparisons; in *Autoliv* he simply highlighted the flaws. In *Royal Mail,* the head-on confrontation between the two obdurate experts narrowed to differences between two irreconcilable regression analyses, which had the effect of cancelling out the econometrics.

C. The Fallacy Of One Truth And Expert Consensus

There is nothing exceptional or untoward about disagreement between experts. It is a fact of life, common among economists, scientists, medical practitioners and other professionals outside the courtroom and in the academy. Disagreement, competing theories and different interpretations of facts are central to the scientific method. As the then US Federal Trade Commission economists David Scheffman and Mary Coleman put it:

> "It is very common in science for studies to have conflicting conclusions. Indeed, the scientific method highlights the benefits of having multiple studies, perhaps with conflicting conclusions, in determining the "truth." It is not scientifically appropriate (nor does it serve the objective of sound decision making) to take the general approach that conflicting econometric studies "cancel one another out." If science took this approach there would be little useful science. As noted, different results come from different modelling or econometric analysis, data, assumptions, or mistakes. With the assistance of economists, attorneys and fact finders should be able to make conclusions on the direction and weight of econometric evidence based on mistakes, appropriateness and limitations of data, and the viability of the economic model given the

> other evidence in the case, rather than a simple "canceling out," unless the proper conclusion is that the econometric analyses are not conclusive".[72]

Conflicting views have not been confined to expert witnesses. It extends to judges in recent UK antitrust cases. For example, consider the four retailer card interchange fee decisions against Mastercard and Visa.[73] The judgments concern similar damage claims by large retailers against Mastercard and Visa for charging excessive credit and debit card multilateral interchange fees. In four separate judgments, the High Court and Tribunal took diametrically opposite views of the facts, counterfactuals, the theory of harm and, surprisingly, the law[74]. They dealt with the expert evidence in conflicting and confusing ways. In *Sainsbury's v. MasterCard*[75], the economists' evidence was rejected by the CAT because they were not experts on credit and debit card schemes, and it ignored the evidence of the parties' witnesses of fact to base its decision on the Tribunal's hypothetical counterfactual, which was rejected to all parties to the litigation. The High Court in two subsequent cases rejected the CAT's counterfactual and accepted that economists could give evidence on the operation of Visa and Mastercard card schemes and the appropriate counterfactual. The Court of Appeal[76] then heavily criticised all three first instance judgments – their judgments were a mess, they should have accepted the European Commission's counterfactual, the CAT's bilateral counterfactual was misconceived, it should not have ignored the evidence of the parties, they erred in law and so on. The future possibility of such inconsistency has been mitigated by the CAT under its umbrella proceeding, where similar cases can now be gathered, and common issues heard together.[77]

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[72] David Scheffman and Mary Coleman, FTC Perspectives on the Use of Econometric Analyses in Antitrust Cases, US Federal Trade Commission, no date.
[73] *Asda Stores* (n 13); CAT *Sainsbury's* (n 26).
[74] Cento Veljanovski, 'Credit Cards, Counterfactuals, and Antitrust Damages - The UK Mastercard litigations' (2018) 9 J. Eur. Comp. Law & Practice 146.
[75] CAT *Sainsbury's* (n. 26).
[76] *Asda Stores v. Mastercard & Visa* [2018] EWCA 1536 (Civ).
[77] CAT Practice Direction 2/2022 - Umbrella Proceedings, 6 June 2022.

VII. The Limitations of Econometrics

It should be fairly evident from the discussion so far that the failure of econometrics has not been due to the inability of the courts to digest statistical evidence. The problem is one largely of technique, not technician. As the Tribunal and courts have reiterated, and which economists have not fully taken on board when appearing as experts, is that econometrics has "recognised limitations".

A. The Selective Application of Econometrics

The main reason why econometrics has not been persuasive in these cases is the inherent limitations of the technique. As Green J said in *Tobacco Packaging*[78] regression analysis has acknowledged limitations which leave it open to manipulation and a lack of precision, quoting law professor Alan Sykes:

> … regression analysis is subject to considerable manipulation. It is not obvious precisely which variables should be included in a model, or what proxies to use for included variables that cannot be measured precisely. There is considerable room for experimentation, and this experimentation can become "data mining," whereby an investigator tries numerous regression specifications until the desired result appears.[79]

This issue was famously aired decades earlier by economist Edward Leamer[80] when he said what many economists already knew - that often econometricians fit their data against a multitude of statistical models, found the one that worked the best, and then pretended that they were using that model all along. Leamer's solution, which has now become routine among applied econometricians, was sensitivity analysis, where the researchers show how their results are affected by different specifications of the regression equation. All who have used econometrics recognise the above description. The results are often

[78] Tobacco Packaging (n 66) [599].
[79] Alan O. Sykes, 'An Introduction to Regression Analysis' (Coase-Sandor Institute for Law & Economics Working Paper No. 20, 1993).
[80] Edward Leamer, 'Let's Take the Con Out of Econometrics' (1983) 73 Am. Econ. Rev. 31.

sensitive to the choice of time periods, variables, specification and the data used.

The selective use of econometrics and scientific evidence is not confined to its use in litigation. It has plagued the scientific world. For decades, peer-reviewed research published in scholarly economics[81], medical and scientific journals have been flawed due to coding errors, poor data cleaning, *p*-hacking and / or the selective specifications and presentation of results[82] to outright fraud. These transgressions have forced learned journals and research organisations to tighten up their peer review processes and ethical standards, which now require constant revision of articles submitted for publication to satisfy stringent professional standards. Nonetheless, the problem persists. A 2024 evaluation of articles published in the prestigious American Economic Review, the house journal of the American Economic Association, found widespread "selective reporting of analytical specifications that exaggerate effect sizes and statistical significance".[83]

This latitude, combined with economists' role as a "partisan expert" retained by the respective parties, puts considerable pressure on some economists, as shown in *Royal Mail*, to select the combination of factors most favorable to their clients. As the Tribunal in *Royal Mail* put it:

> "235. It is perhaps a flaw in the system but in any event appeared quite marked to us in this case that all the experts, but particularly Mr Harvey and

[81] Ben S. Bernanke, 'Editorial Statement' (2004) 94 Am. Econ. Rev. 404, 404 (Editorial response to failure to replicate results by B.D. McCullough & H.D. Vinod, 'Verifying the Solution from a Nonlinear Solver: A Case Study' (2003) 93 Am. Econ. Rev. 873.

[82] John P. A. Ioannidis,' Why Most Published Research Findings Are False' (2005) 2 PLOS Medicine, e124, 0696; John P.A. Ioannidis, T.D. Stanley & Hristos Duolingo, 'The Power of Bias in Economics Research' (2017) 127 Econ. J.; Andrew C. Chang & Phillip Li, 'Is Economics Research Replicable? Sixty Published Papers from Thirteen Journals Say, "Usually Not"' (Federal Reserve Board, Washington, DC, 2015-083) (tried to replicate 67 published papers using data and codes from the original authors. They concluded: "Because we successfully replicate less than half of the papers in our sample even with assistance from the authors, we conclude that economics research is usually not replicable.") Marcus R. Munafo, et al, 'A Manifesto for Reproducible Science' (2017) 1 Nature Human Behav. 1.

[83] Douglas Campbell, et al., 'The Robustness Reproducibility of the American Economic Review' (I4R Discussion Paper Series No. 124 Institute for Replication (I4R) sold, 2024).

> Professor Neven, who opined on a number of different issues, came to conclusions that favoured their clients. In relation to the Overcharge, there are some big and difficult issues in relation to the regression analyses concerning exchange rates, the global financial crisis and emissions standards that significantly affect the outcome of the regression but which seem to us to be difficult and ones on which economics experts could reasonably disagree and on which there may not necessarily be a single correct answer. Many of these issues rest on highly technical choices over the precise specification of the econometric models that the experts employed, the full details of which we could not directly observe. Nevertheless, on all those issues, Mr Harvey and Professor Neven firmly concluded on the side that produced the outcome in favour of their respective clients. Perhaps that is an inevitable consequence of the adversarial process and one should expect a party to have an expert that supported their case."

In *Royal Mail,* the difficulties in finding suitable variables as proxies for key changes and events during the infringement period gave the experts considerable flexibility. But this was not mere "manipulation." The data was incomplete, and the two experts made credible but different choices of how to account for emissions standards, the GFC and exchange rates, which resulted in different outcomes which each satisfied standard robustness tests. As the Tribunal concluded:

> "475. Despite the enormous amount of work that went into the expert process on this case, and the vast quantities of data analysed, there are numerous serious gaps and unresolved issues in the analyses which taken together makes it difficult to distil the experts' work on Overcharge into a simple definitive figure. Nor is it feasible to specify an "ideal" regression equation, based on the various work of the experts, that could be relied upon to yield the correct answer to the Overcharge question which would navigate successfully between the rival claims and conflicting conclusions reached by the experts. There are too many imperfections in the

> evidence, and insoluble practical problems, to allow any such approach."

As the Tribunal concluded in *Royal Mail,* there was no "ideal" regression which would resolve these "insoluble practical problems."[84]

B. Theory Before Econometrics

The Tribunal in *Autoliv* took a sterner, more purist view. It accused the expert of "data mining" by adjusting his econometrics to show a positive overcharge. The term is another way of describing the problem just discussed. There is little question that he did this. The Tribunal in *Autoliv* warned that: "[T]he theory of harm which is being tested should not be adjusted or revised in the light of the econometric data to ensure some desired result.[85]" The theory of harm should be set out first.

This view is not universally shared. Sir Marcus Smith J has criticised economists for having prior views on the "correct analytical approach" which guides their selection of the facts. He argued that the economist should first look at the adduced facts and then frame their analysis. This is also too severe, if only because the "adduced facts" as found by the court are not known to the expert before trial and when he or she exchange their expert reports. Moreover, what is a "fact" in an antitrust case is not straightforward, given the economic and legal nature of the offences.

Methodologically, the Tribunal's stance in *Autoliv* is correct[86]. However, regression analysis is inevitably a trial-and-error process necessary to understand the data, select suitable variables and specify the regression equation. Starting with a theory of harm does not resolve this. Opposing experts can and will set out different theories of harm and implement their regression analysis to confirm,

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[84] For a suggested approach to deal with different estimates see Peter Bönisch & Roman Inderset, 'Using the Statistical Concept of "Severity" to Assess the Compatibility of Seemingly Contradictory Statistical Evidence (With a Particular Application to Damage Estimation)' (2022) 18 J. Comp. Law & Econ. 400.

[85] *Autoliv* (n 5) [201].

[86] This view of scientific methodology underpins the Daubert test used in US Federal Courts in the pre-trial evaluation of expert evidence following *Daubert v. Merrell Dow Pharmaceuticals Inc.,* 509 U.S. 579, 593 (1993) ("Scientific methodology today is based on generating hypotheses and testing them to see if they can be falsified; indeed, this methodology is what distinguishes science from other fields of human inquiry").

as best they can, those theories, leaving the court to resolve the inevitable differences and statistical problems. There is no theory which will identify all the relevant variables from those practically available, and no regression analysis which would include all the factors that influence prices.

The dictum that economists should set out a theory before embarking on empirical analysis has had one adverse consequence. It is now common for experts to file a separate plausibility report, which sets out their theory of harm. This emerging practice is a minefield. Its major danger is that it encourages the expert to defend or promote the client's case based on theory, selective interpretation of the documentary evidence and descriptive data, as happened in *Royal Mail*. There are ample examples where economists have concocted theories of why this or that action is pro- or anti-competitive. A plausibility report risks being seen cynically as reinforcing the predictable pro-client bias of the respective expert.

C. UNSTANDARD ERRORS

It is now de rigueur to include sensitivity analyses to test the "robustness" of the econometric analysis. Sensitivity analysis is "[t]he process of checking whether the estimated effects and statistical significance of key explanatory variables are sensitive to inclusion or exclusion of other explanatory variables, changing the functional form, dropping outlying observations, or different methods of estimation".[87] In *BritNed, Royal Mail* and *Autoliv* the sensitivity analyses of the claimant's regressions fatally undermined their evidence.

While sensitivity analysis is a useful and necessary requirement, it is only a partial test of the "reliability" of regression analyses. The sensitivity analysis will help in assessing a particular regression, but it cannot evaluate different approaches convincingly. As was said in *Royal Mail*: "Both [experts] reached conclusions that, whilst they fell within the range of robustly arguable positions, were clearly influenced in favour of the commercial interests of their respective clients[88]." The Tribunal was led to consider the technical aspects of the choice of variables,

[87] Jeffrey M. Wooldridge, *Introductory Econometrics: A Modern Approach* (4th edn Blackwell Publishing 2009) 845.
[88] *Royal Mail* (n 3) [480].

and to take a position on the weight it should give each, if only subjectively.

But this again is a common phenomenon in scientific and academic research. Individuals and research teams using the same data can come to very different conclusions because of the choices they make in implementing regression analyses – the choice of variables, the treatment of outliers, etc., specification of the regression equation and so on. At one level, these are legitimate differences within the bounds of statistical credibility. But they increase the uncertainty surrounding regression estimates beyond that given by the conventional measures of statistical significance based on standard errors. This gives rise to "unstandard errors" arising from different approaches to analysing the same issue with the same or similar data[89]. Or what Roth J, a past President of the CAT, more prosaically described as the "passing ships in the night" problem. The differences cannot be resolved by sensitivity analysis. There is no conventional tests for choosing between different but otherwise credible regressions.

The courts and the Tribunal are therefore correct to treat econometric evidence critically and circumspectly. The fact that econometrics can generate overcharge estimates ranging from zero to 15% or more using the same data, the same statistical technique and the same statistical software demonstrates its fluidity. As the Court of Appeal observed in *UK Trucks v. Stellantis:*

> …. any regression analysis and determination will be highly sensitive to the assumptions made and data input. There is an inevitable element of subjectivity both in the selection of the data and these assumptions.[…], complete objectivity in expert economic evidence cannot really be achieved. … . Since there is no single, objectively ascertainable, 'right' answer to the overcharge pass on issue, and the decision of how to advance an argument on this issue in the proceedings will

[89] Albert J. Mencel and others, 'Nonstandard Errors' (2024) LXXIX J. Finance 2339.

> inevitably involve some strategic considerations …[90]

The Tribunal now evaluates the statistical "reliability" of the experts' regression analyses. It will consider the differences, whereupon it will wield the "broad axe" to deal with the remaining uncertainties. This said, the Court of Appeal is "precisely the sort of situation where wielding the broad axe is appropriate."[91] Or as Judge Pelling in *Granville* said*,* in a more nuanced approach, the court will use the broad axe to deal with the uncertainties inherent in the quantification of damages. It has also led the Tribunal to undertake extensive case management and requiring the experts to set out pre-trial methodology statements[92], gain agreement on methodology and data, and in multiparty litigation to sometimes order that a single expert be appointed to avoid multiple conflicting expert evidence.

D. INFRINGEMENT V CARTEL PERIODS

In *Autoliv,* the Tribunal rejected the claimant's expert use of documentary evidence to set the duration of the cartel. This draws attention to a major, little-discussed issue, or more accurately, a legally induced flaw, surrounding the use of econometrics in damage cases.

Most econometric models in follow-on damage claims use the infringement period stated in a competition authority's decision as the period during which the cartel operated. This infringement period is based on the documentary and witness evidence available to the competition authority, which establishes the period over which the cartelists coordinated their activities and which can be proved by the authority in a way that minimises the cartelists successfully appealing the authority's decision. As a cartel operates in secret, such evidence will be very incomplete, so there is no reason to suppose that the infringement period correctly identifies the period over which the cartel was effective in raising prices[93].

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[90] *UK Trucks Claim Limited v. Stellantis NV & Ors* [2023] 's96].
[91] CA *Royal Mail* (n 39).
[92] *Dawson plc v. DAF Trucks N.V.* [2020] CAT 3.
[93] The Practical Guide (n 9) [154] notes the problem stating that any adjustments to the infringement period "will depend on the rules of the applicable law".

There are numerous European Commission decisions which comment that the cartel likely operated in the years before and/or after the infringement period. This was so for the LCD panels cartel. The Commission was uncertain as to the end date of the cartel, which it initially set as at June 2006 and then 1 February 2006 and then asked the addressees in 2010 when it published its decision "to bring the infringement to an end (if they have not already done so)". Even if the cartelists ceased their collusion at midnight of 1 February, as Judge Pelling HH observed in *Granville* "it would be both unusual and highly unlikely that the effects of a worldwide price fixing cartel would be eliminated at midnight on that day". The cartelists, through their decades long contacts, exchanges of information in fairly concentrated markets, would have learned much about their competitors' commercial behaviour which would enable them to tacitly coordinate their prices, which could continue for months or forever[94].

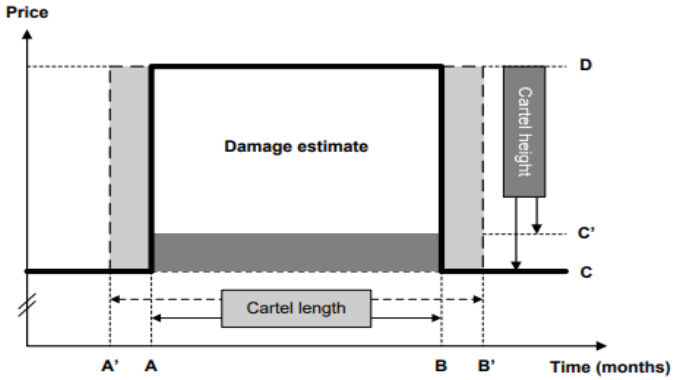
It is now routine for claimants to plead a run on period after the end date of the infringement period as set down in a competition authority's decision based on the argument just made. In *Granville,* the possibility of such "price persistence" was endorsed by the Court and used to give an uplift to the expert's percentage overcharges. It is also noteworthy that HH Judge Pelling in *Granville* dismissed the argument that pleading a run period constitutes a "hybrid action", i.e. a part follow-on and part standalone action, the latter requiring the claimant to establish liability. He said that it was part of the general assessment of damages, even accepting the infringement period as correct.

Determining the cartel period is crucial for an econometric analysis. Most regressions are during-and-after or before-during-and-after timeseries using the dummy variable for the months of the Commission's infringement period. If these dates are not aligned with the actual cartel period, then the regression will be mis-specified, and the overcharge will not be correctly estimated. The problem can be illustrated using Figure 3, borrowed from

[94] *Granville* (n 4) [137].

Hüschelrath, Müller and Veith[95], which distinguishes the overcharges (cartel height) and duration (cartel length). Since aggregate overcharges are the product of cartel height times cartel length, using the wrong cartel length will give the wrong aggregate overcharge damages, both because the periods differ and because the cartel dummy fails to pick up pre- and / or post-infringement uncartelised prices. In Figure 3 the aggregated overcharge damages could be either the white rectangular area or include some of the shaded areas.

FIGURE 3 CARTEL LENGTH, HEIGHT AND DAMAGES



Source: Hüschelrath, Müller & Veith.

Questions about cartel length were central to the assessment of the econometrics in *Autoliv.* There, the Claimant's expert sought to determine the cartel period in two ways, both rejected by the Tribunal - econometrically based on whether the regression showed a statistically significant price increase; and by reading disputed documentary evidence. The claimant's expert was asked at trial whether, absent the documentary evidence and the Commission's OSS decisions, his econometric analysis could establish the existence of a cartel. He accepted that he had inferred the cartel period from the presence of higher prices but that "other factors that I may have failed to capture in my model" could be the cause, thereby conceding that his model had not "proved" that the cartel "caused" the higher prices.

The expert conceded too much if his answers are taken as a general statement about the use of econometrics to

[95] Kai Hüschelrath, Kathrin Mueller & Tobias Veith,' Estimating Damages from Price-Fixing—The Value of Transaction Data', (2012) 9 Eur. J. Law & Econ. 1.

determine cartel duration. There are well established statistical procedures that can be used to detect and date cartels.[96] These examine changes in price patterns for so-called structural breaks arising from anomalous or highly improbable patterns in the movement of prices. For example, economic theory suggests that a cartel's higher prices are often accompanied by a decline in the frequency and magnitude of price adjustments, i.e. the variance of prices. Thus, the start and persistence of a reduction in the variance of prices can be used as an indicator of the presence of a cartel. Breaking the data into periods with different price variances can then be tested to determine whether the structural breaks in the data are statistically significant using the Chow, Quandt, and/or Bai-Perron[97] tests.

These approaches have been used by academics and competition authorities to detect cartels and cartel duration[98] (and are sometimes referred as screening devices or techniques). Two examples of the latter are Huschelrath *et al*[99] structural break analysis to date the end of the German cement cartel; and Boswick, Bun and Schinkel[100] who found that the European Sodium Chlorate[101] cartel operated from January 1995 to February 2002, and not from September 1994 to February 2000 as stated in the European Commission's infringement decision. Based on

[96] Joseph E. Harrington, Jr., Detecting Cartels in Paolo Buccirossi, ed. *Handbook of Antitrust Economics* (The MIT Press 2008).

[97] Jushan Bai & Pierre Perron, 'Estimating and Testing Linear Models with Multiple Structural Changes' (1998) 66 Econometrica 47; Jushan Bai & Pierre Perron, 'Computation and Analysis of Multiple Structural Change Models' (2003) 18 J. Applied Econometrics 1.

[98] Dennis W. Carlton, 'Using Economics to Improve Antitrust Policy' [2004] Colum. Bus. L. R. 283 Annex I; Carsten J. Crede, 'A Structural Break Cartel Screen for Dating and Detecting Collusion' (2019) 54 Rev. Indus. Econ. 543; Harrington (n 96) (proposes the Quandt-Andrews test for a single unknown break date); Rosa M. Abrantes-Metz and others, 'A Variance Screen for Collusion' (2006) 24 Int'l J. Indus. Org. 467; Fabio M. Esposito & Massimo Ferrero, 'Variance Screens for Detecting Collusion: An Application to Two Cartel Cases in Italy' (Italian Competition Authority 2006); Joseph E. Harrington, Jr. & David Imhof, 'Cartel Screening and Machine Learning' (2022) 2 Stanford Computational Antitrust 133; Joseph E. Harrington, Jr., 'Cartel Screening is for Companies, Law Firms, and Economic Consultancies, Not Just Competition Authorities (Investigaciones CeCo, Nov. 2021).

[99] Kai Hüschelrath, Kathrin Mueller & Tobias Veith, 'Estimating Damages from Price-Fixing—The Value of Transaction Data' (2012) 9 Eur. J. Law & Econ. 1.

[100] H. Peter Boswijk, Maurice J.G. Bun & Maarten-Pieter Schinkel, 'Cartel Dating' (2018) 33 J. Applied Econometrics 1.

[101] Case COMP/38.695 - Sodium Chlorate Comm'n Decision (11 June 2008).

their analysis authors found that using the Commission's dates underestimated overcharge damages by 25%.

E. Sequencing Of Reports

The Tribunal can order the simultaneous or sequential exchange of expert reports and witness statements. The Tribunal has tended to order the simultaneous exchange of expert reports and factual evidence, which disadvantages the defence. It is the claimant who has the burden of proving and quantifying any overcharge damages. It follows that the defendants should be in a position to see the expert evidence on which the claim is based. If the court orders the simultaneous exchange of reports, the defendant's expert is operating in the dark. This may be overshadowed by the need for judicial economy and the desire to expedite the trial. However, if the claimant expert's report is weak, biased and speculative, the defendant may decide, as happened in *Autoliv,* that there is little value in undertaking an independent regression analysis, and much to be gained by criticising the claimant's regression.

This is seen from the different strategies taken by the defendant's experts in *Autoliv* and *Granville*. In *Autoliv,* the defendant's expert, while he initially insisted to the Tribunal that he wanted to and would file a separate econometric analysis of overcharges even taking this demand to the Court of Appeal[102], decided at trial to simply attack the claimant's econometrics. This was allowed, successful and disposed of the claim. In *Granville,* the expert, despite the flawed approach of the claimant's expert's trend analysis, filed an econometric analysis, which was accepted by the court. But the consequence of his doing this was that he effectively "proved" and quantified the overcharges, albeit much smaller than pleaded by the claimants. Had the defendants' expert in *Granville* not undertaken an econometric analysis showing a statistically significant overcharge, the damage claim would almost certainly fail.

F. Econometric Versus Documentary Evidence

Econometric evidence must be backed up by adduced facts and documentary evidence. This is what the Tribunal

[102] *Stellantis v. Autoliv AB* [2024] EWCA Civ 609.

expects and is the general advice, perhaps best summarised by the Practical Guide :

> "… econometric modelling can be useful, but it inherently involves simplification and reliance upon multiple assumptions and rarely, if ever, is it conclusive in and of itself. It must therefore be verified against the evidence it relies upon and the real life facts of the markets in which it operates".[103]

In the decided case, the failure to do so has been fatal.

In *BritNed,* the documentary evidence trumped the econometrics. The judge found that the tenders had been put together by the Defendant's employees on competitive terms, as they were unaware of the cartel. The overcharge was therefore zero. This was reinforced by the defendant's margin analysis, which showed that during and after, gross margins were similar

In *Royal Mail* DAF's expert's theoretical prognostications that the coordination between the truck manufacturers could not have led to price rises "was contradicted by DAF's own witness evidence, in particular [Witness B] who described several highly plausible links between list price changes and transaction prices and said that he expected from his years of experience for approximately half of the list price increase to be translated into transaction price increases."

In *Autoliv,* the Tribunal was highly sceptical of the claimant's econometric estimate of overcharges of 10% to 25%, saying that "experienced and sophisticated purchasers with countervailing purchasing power" would be expected to take issue with such large overcharges. The Tribunal took as a rebuttable fact that the "car manufacturers are well-established buyers with a high level of expertise and have the capacity to counter price increases in the absence of cartel activity"[104] based on the Commission finding that "the market investigation revealed that, in the present case, automotive OEMs would likely be able to counter attempts of airbags, steering wheels and seat belts manufacturers to increase prices

[103] Practical Guide (n 9) [15].
[104] *Autoliv* (n 5) [87].

through coordinated behaviour."[105] "[T]here is a lack of contemporary documentation showing that the Stellantis groups found prices to be in excess of that which they would have expected[106]."

In using and relying on documentary and factual evidence, the expert walks a tightrope. It is easy to pick up some statements or documents that purport to say one thing or the other, but it is for the judge and Tribunal to make findings of fact. If, as in *Autoliv,* the expert's purported documentary interpretations are dismissed so will be his evidence on that point.

Recent judgments have, however, thrown the issue into disarray.

In *BritNed,* the court developed a novel head of cost-based damages that were not pleaded by either party. It gave damages for so-called baked-in cost inefficiencies based on one document suggesting the defendant's bids used thicker and therefore more expensive cables than its competitors.[107] There is no way the economist or lawyer would have predicted that this would be an adduced fact at trial, and as the Court of Appeal said, these were, to put it crudely, made-up facts by the judge and an error of law.

In *Autoliv*, the claimant's expert was criticised for inferring the start of cartel activity "by reference to disclosure documents." The Tribunal said that the expert "investigating and interpreting documentary materials" "trespassed on disputes of fact which were matters for the Tribunal not him"[108]. Yet it cited Green J in *Peugeot v NSK* (albeit only ruling on disclosure):

> "In principle I start from the proposition that it is desirable for econometric analysis to be capable of being benchmarked, or capable of being placed into context, by internal disclosure. Many econometric

[105] OSS 1 at recital 84.
[106] *Autoliv* (n 5) [230].
[107] Cento Veljanovski, 'Damages for Bid-rigging - The English High Court's idiosyncratic cost-based approach in BritNed' (2019) 10 J. Eur. Comp. Law & Practice 109; Cento Veljanovski, 'The UK Court of Appeal clarifies principles governing competition damages and reiterates that judges must base their decisions on the evidence before them by exclusively focusing on the loss of the claimant (BritNed/ABB)' (2019) e-Competitions Bulletin Art. N° 92893.
[108] *Autoliv* (n 5) [158].

> analyses involve the making of assumptions about how markets work. If those assumptions turn out to be incorrect, wholly or partially, then the resultant statistical analysis may be materially flawed…. If, to take a hypothetical situation, an expert generated an econometric model which then turned out in court to collide with the inferences properly to be drawn from internal disclosure then it would have been far better for the expert to have grappled with that inconsistency and attempted a reconciliation at the earliest possible stage in preparation for litigation. This, in my view, is preferable to the expert being subsequently challenged in cross examination at trial upon the basis that the econometric modelling was theoretical, artificial and divorced from reality. Early engagement with the underlying facts including disclosed material will, in my view, generate a more robust and defensible final analysis."[109]

While the Tribunal agreed, it said that Green J did not have in mind the use of disclosure documents to determine the start date of the cartel. This, with respect, is a bizarre restriction since a) the competition authorities rely on such evidence to determine the duration of the infringement; and b) in the absence of a Commission decision or the ability to use witness and documentary evidence this limitation would forestall the expert from identifying the actual duration other than by some statistical or accounting method.

G. TRIBUNAL OR JUDGE

Two of the four cartel damage cases were brought in the High Court (*BritNed, Grenville*) and two in the CAT (*Royal Mail, Autoliv*). Did this make a difference?

These two fora are very different. The High Court sits with a single generalist judge; the CAT is a specialist tribunal which sits as a three member panel – a judge and two ordinary members who are often specialists in antitrust law, accountancy or economics - and has a more inquisitorial procedure. There is, however, a crossover as those chairing

[109] *Peugeot v. NSK (Ruling (Disclosure))* [2017] CAT 2 [21].

the Tribunal's panels are usually High Court judges appointed to the Tribunal.

The CAT has generally been sympathetic to econometrics and has suggested it as the more appropriate approach in its pre-trial case management. Yet the two cases decided by the CAT – *Royal Mail* and *Autoliv* – rejected the econometric evidence. The High Court judgments were split – in *BritNed,* the econometric evidence was rejected; in *Granville* accepted albeit from the defendants' expert.

While the sample of four judgments is too small to make wild generalisations, they show that there is little difference in the ability of a single judge and three-member interdisciplinary panel to assess econometric evidence.[110] Marcus Smith J and HH Pelling, sitting as single judges, in *BritNed* and *Granville* respectively, gave judgments of the same quality as the Tribunal (although Marcus Smith J had then already been cross-appointed as a Chairman and later President of the Tribunal).

VIII. Conclusion: What Should Experts Do?

These four judgments and the rulings of the Tribunal now give guidance, not always unambiguous, to experts in the presentation of econometric evidence.

First and foremost, the expert must follow the expert rules. This requires transparency, independence, proportionality and reasonableness. The onus is on the expert to give a frank account of his or her evidence, to "consider all material facts, including those which might detract from their opinions"[111] assist the Tribunal and cooperate with the other experts[112]. As the Court of Appeal said the CAT is "entitled to expect experts to adjust their opinions even to the detriment of their clients, in light of evidence as it emerges" and in light of the experience of *Royal Mail* that "an expert whose heels remain firmly dug in, might find such obduracy taken into account adversely, by the CAT in the final account".[113]

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110 Douglas H. Ginsburg & Joshua D. Wright, 'Antitrust Courts: Specialists Versus Generalists' (Fordham Competition Law Institute, September 20, 2012).
111 Practice Directive 35 PD35 2.3.
112 Competition Appeal Tribunal Rules 2015, rule 4(7).
113 CA *Royal Mail* (n 39).

The caselaw and Tribunal rulings give practical guidelines for the expert[114]. These include:

1. Regression analysis should be based on the articulated theory of harm and be used to test that theory.
2. The expert should declare the extent of his involvement with the client. If he has previously acted as an advisor to the client, this must be declared (*Royal Mail*). There is no general prohibition against an advisor acting subsequently as an expert.
3. The expert should resist filing a separate "plausibility statement" based on theoretical, speculative and/or novel arguments. Providing the economic basis and support for the estimated overcharge should be incorporated in the Positive Case expert report.
4. The expert should undertake extensive sensitivity analyses of his preferred regressions, which fairly takes account of data and specification difficulties.
5. The expert should explain clearly why the preferred regression model has been selected, and state which regressions and other analyses were rejected and why (*Autoliv*).
6. There should be ample consideration of omitted variable basis (*Autoliv*).
7. The expert should fairly respond to identified shortcomings and criticism of his econometric model. The court is likely to take a negative view of the expert who is obdurate and unyielding (*Royal Mail).*
8. Regression analysis based on data from one defendant cannot be transposed to measure damages for another unconnected business (*Autoliv*).
9. The regression analysis should be supported or at least be consistent with the adduced facts and documentary evidence at trial. However, it is not the function of economists to interpret documentary evidence and to usurp the fact-finding role of the court and Tribunal.

[114] See Peter Kennedy's perceptive ten commandments of applied econometrics in Peter Kennedy, *Guide to Econometrics* (6th edn Wiley-Blackwell 2008) Chap. 22.

10. The dates of the cartel cannot be set by the expert reading disputed documentary evidence (*Autoliv*).
11. Determining the cartel period based on the existence of periods where prices are high is not sufficient to prove the existence of a cartel or harm caused by that cartel unless other factors explaining those higher prices can reliably be ruled out by the modelling and/or factual evidence.
12. The claimant has the burden of proof; it must prove the overcharge.
13. The defendant's expert should urge the sequential exchange of expert reports.
14. The defendant's expert should ideally undertake an independent quantification of harm. However, it is permissible for the defendant's expert to restrict his or her evidence to challenging the robustness / reliability of the claimant's expert evidence (*Autoliv*). The latter would be the preferred course if the Claimant's evidence is seriously flawed.
15. The experts should "exercise some restraint and sense of proportion in the preparation of their expert evidence" by limiting the volume to that which is necessary (*Royal Mail*). As the Tribunal has commented, "the potentially endless ping-ponging of expert evidence where each expert puts in a further report responding to the criticism in the last report of the opposing expert"[115] should be curtailed if not avoided.
16. The joint experts' statement (JES), required at the end of the pre-hearing exchange of reports, should succinctly state the areas of agreement, disagreement and reasons for the disagreement. The JES should not be a lengthy, repetitive and argumentative rehash of the evidence (as it has now become).

[115] *Generics UK v. CMA (ruling expert evidence)* [2016] CAT 24 at §5.