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EUROPEAN LEGAL STUDIES

Research Paper in Law 03 / 2021

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RESEARCH PAPERS IN LAW

3/2021

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Introduction

Algorithms are widespread across many industries. They are deployed to efficiently manage business processes and automate decisions. They are becoming increasingly sophisticated; capable of executing complex processes for businesses. They can improve efficiency and bring many benefits to consumers.

However, algorithms can also cause substantial consumer harm. They are increasing transparency, the speed of business decisions and the ability of companies to immediately respond to rivals' actions. In this manner, they exacerbate one of the longstanding quandaries of competition law: tacit collusion.

Tacit collusion falls outside the scope of Articles 101 and 102 TFEU. Notwithstanding the potential anticompetitive effects when firms observe each other's market actions and adopt the same strategy, it was felt that, from a legal perspective, mere conscious parallelism should not be prohibited. This theory is placed under increased scrutiny in an age where algorithms facilitate tacit collusion and make it more sustainable.

This issue has attracted the attention of many competition authorities and academics, with various suggested solutions emerging. With limited empirical evidence of tacit collusion in existence, many stress the need for more information about how algorithms operate on the market and cause tacit collusion. Accordingly, a market investigation tool endowed with behavioural and structural remedies, capable of intervening in markets susceptible to tacit collusion, has been a commonly suggested solution.

In June 2020, the European Commission proposed a New Competition Tool of this kind, designed to tackle structural competition problems falling outside the scope of the current competition toolbox. They explicitly identified as a theory of harm structural problems in oligopolistic markets caused by an increase in the use of algorithmic solutions. However, in the draft Digital Markets Act (DMA) that followed this proposal, the New Competition Tool was substantially pared back, rendering it useless in tackling algorithmic tacit collusion in the manner initially envisioned.

This article will argue that algorithmic tacit collusion is a very real issue that merits attention from competition authorities. It will argue that a market investigation tool endowed with behavioural and structural remedies would be an effective means of tackling it. It will examine why the European Commission's proposed New Competition Tool (NCT)[1] was pared back in the resulting DMA proposal.[2] Lastly, it will look at issues the Commission would face if, in the future, it again considered adopting this type of market investigation tool.

[1] Commission Inception Impact Assessment, (2020)2877634, 4 June 2020, retrieved 20 April 2021, https://ec.europa.eu/competition/consultations/2020_new_comp_tool/new_comp_tool_inception_impact_assessment.pdf.

[2] Commission Proposal for a Regulation of the European Parliament and of the Council on contestable and fair markets in the digital sector (Digital Markets Act), COM(2020) 842 final (15 December 2020).

1. Tacit Collusion

Article 101(1) TFEU prohibits coordination between undertakings under three categories of unlawful collusion: agreements, decisions by undertakings, and concerted practices.[3] These are forms of explicit collusion. There are markets where, by virtue of the number of operators and the characteristics of the market, it is possible for firms to coordinate their behaviour *without* entering into an agreement or being part of a concerted practice in the sense of Article 101(1) TFEU. This situation is described as tacit collusion.[4] This poses a clear problem for competition policy, as firms can coordinate their behaviour in such a way that produces anticompetitive effects on the market, without engaging in a prohibited practice under 101(1) and thus falling outside its scope.

Tacit collusion is linked to the problem of oligopoly. An oligopoly is a market form lying in between the poles of monopoly and perfect competition, where there are only a few sellers. Firms operating in such a market realise that what they do is dependent on the behaviour of other firms operating in the market, and that they are better off if they coordinate their behaviour and charge higher prices.[5] Market rivals are therefore said to be interdependent: they are acutely aware of each other's presence and are bound to one another's marketing strategy, resulting in minimal or non-existent competition.[6] The "problem" therefore, is that these conditions could give rise to tacit collusion, causing harm to consumers, yet falling outside of the reach of competition law.[7]

Economists have estimated that there are certain conditions that must exist for tacit collusion to occur. One key condition is that the market must be sufficiently transparent so that competitors can accurately observe each other's conduct on the market.[8] This is necessary to monitor whether the other members are adhering to the common policy. Members should be able to determine with some certainty whether unexpected behaviour is the result of deviation from the terms of coordination.[9] There must also be an incentive not to depart from the common policy and an effective means of retaliation against a member in the event of departure. Such retaliation should outweigh the short-term benefits gained from departing from the collusion. In addition, potential competitors or customers should not be able to jeopardise the results expected from the coordination.[10] For collusion in the more general sense, the fewer firms operating on the market, the higher the entry barriers, and the more frequent the interactions between the firms, the easier the collusion will be to sustain.[11]

Tacit collusion poses a legal challenge as it harms consumer welfare but can simply be the result of firms in an oligopoly rationally engaging in parallel conduct. Nevertheless, it is clear from the case law of the Court of Justice that conscious

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[3] F. BENEKE, M.O. MACKENRODT, 'Remedies for algorithmic tacit collusion', (2020) 0 *Journal of Antitrust Enforcement,* p.1-25, at 5.
[4] R. WHISH, D. BAILEY, *Competition Law,* 7th, ed., Oxford University Press: Oxford, 2007, p.562.
[5] A. JONES, B. SUFFRIN, *EU Competition Law,* 4th, ed., Oxford University Press: Oxford, 2011, p.786.
[6] *Ibid.*
[7] *Algorithms and Collusion: Competition Policy in the Digital Age,* OECD, Paris, 2017.
[8] A. EZRACHI, M. STUCKE, *Virtual Competition The Promise and Perils of the Algorithm-Driven Economy,* Harvard University Press: Cambridge, Massachusetts, 2016, p.60.
[9] *Ibid.*
[10] *Ibid.*
[11] C.S. HUTCHINSON, G.F. RUCHKINA, S.G. PAVLIKOV, 'Tacit Collusion on Steroids: The Potential Risks for Competition Resulting from the Use of Algorithm Technology by Companies', (2021) 13 *Sustainability* 2, p. 1-14, at 7.

parallelism is not illegal under EU law. However, whether this means tacit collusion can *never* fall under the scope of the EU competition rules is not settled.

1.1. Agreements

The first category of unlawful coordination under Article 101 TFEU is "agreements". The case law tells us that an "agreement" requires an expression or joint intention by the parties to behave in a certain way on the market and there must be a meeting of the minds or a concurrence of wills, the form of which is irrelevant.[12] It implies some form of communication and a sense of mutual engagement.[13] Tacit collusion therefore could not fall under the definition of agreement as it does not involve communication.

1.2. Concerted Practices

The concept of "concerted practice" appears more capable of catching tacit collusion. In *Dysetuffs*[14] it was held that its purpose is to prohibit "a form of coordination between undertakings which, without having reached the stage where an agreement so-called has been concluded, knowingly substitutes practical cooperation between them for the risks of competition".[15] There must be a mental consensus between the undertakings to this end[16] and a causal relationship between a concertation and a subsequent conduct.[17] With regards to parallel behaviour, the court remarked in *Dysetuffs* that although parallel behaviour itself may not be identified with a concerted practice, it may amount to strong evidence of it, if it leads to conditions which do not correspond to the normal conditions of the market.[18] However, in other cases, mere parallel conduct has been distinguished from collusion under Article 101 TFEU, with the ECJ confirming that intelligent responses to a competitor's behaviour would not bring a firm within its scope.[19] This distinction is vital to preserve the free market, as the Commission would be adopting an overly paternalistic role if it intervened in all instances where there is evidence of parallel conduct. However, one notes the potential difficulty in distinguishing lawful parallel behaviour from unlawful collusion. [20] The judgment of *Woodpulp*[21] expanded further on the relationship between parallel behaviour and the finding of a concerted practice. It confirms that parallel behaviour cannot be relied upon as proving, of itself, the existence of a concerted practice, unless, after detailed economic analysis, that is the only plausible explanation.[22] This leaves open the possibility for a case of tacit collusion being ruled as a concerted practice under Article 101 TFEU, in a case where there is parallel conduct and no plausible explanation for that conduct other than the existence of a concerted practice. However, such a case would face significant challenges, such as producing sufficient evidence to show that the parallel behaviour was collusive rather than non-collusive and rebutting any other explanation for the parallel conduct. Nevertheless, some

[12] F. BENEKE, M.O. MACKENRODT, *supra* note 7*,* p.5.
[13] C.S. HUTCHINSON, G.F. RUCHKINA, S.G. PAVLIKOV, *supra* note 15*,* p.6.
[14] Case 48/69, *Imperial Chemical Industries Ltd. v Commission of the European Communities* [1972] ECR 619.
[15] *Ibid*, para. 64.
[16] R. WHISH, D. BAILEY, *supra* note 8, p.113.
[17] F. BENEKE & M.O. MACKENRODT, *supra* note 7*,* p.6.
[18] *Imperial Chemical Industries Ltd., supra* note 13, para. 66.
[19] Case 172/80, *Zuchner v Bayerische Vereinsbank AG* [1981] ECR 2021, para. 14.
[20] Cases 40/73 etc, *Suiker Unie v Commission* [1975] ECR 1663, para. 174.
[21] Cases C-89/85 etc, *A Ahlström Oy v Commission,* [1993] ECR I-1307.
[22] Trevor Soames, *'*An analysis of the principles of concerted practice and collective dominance: a distinction without a difference?*',* (1996) 17(1) *ECLR*, p.24-39, at 29*.*

academics have argued that the concept of concerted practice is sufficiently flexible to deal with cases of algorithmic tacit collusion,[23] which will be discussed later in this paper. The important net point is that non-collusive, autonomous parallel behaviour does not qualify as a concerted practice and is not prohibited under Article 101 TFEU. Both explicit and tacit collusion can reduce competition and harm consumer welfare, which has led some economists to call for the prohibition of tacit collusion.[24] It is merely on a legal point that it is allowed. It is not my submission that this should change, and that conscious parallelism should be outlawed. However, as I will demonstrate, algorithms have the potential to make tacit collusion easier to achieve and therefore more widespread, at which point its detrimental effects on competition become a more pressing concern. It is this exacerbation of harm that algorithms could potentially engender that justifies consideration of a change of approach.

2. Algorithmic Tacit Collusion

2.1. What are Algorithms?

There is no universally accepted definition of an algorithm.[25] In computer science, it has been defined as "any well-defined computational procedure that takes some value, or set of values, as input and produces some value, or sets of values, as output."[26] Put simply, it is a sequence of instructions to perform a computation or solve a problem.[27] Algorithms have been used for many years to improve efficiency in business processes in areas such as manufacturing, supply chain logistics and pricing decisions.[28] Recent developments in machine learning and artificial intelligence, as well as the availability of increasingly large volumes of granular data, have enabled the use of algorithms in the automation of more complex processes. Their use is now widespread in a range of contexts, industries and applications, and they are central to the operations of some of the world's largest companies, such as Google and Facebook.[29]

2.1.1. Pricing Algorithms

The focus of this article is pricing algorithms. Pricing algorithms are commonly understood as the computational codes run by sellers to automatically set prices to maximise profits.[30] They are capable of processing large amounts of data that are incorporated into the optimisation process, allowing them to react fast to any change in market conditions. They are used to engage in dynamic pricing – that is the implementation of continuous price changes over time. [31]

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[23] G. SONDEREGGER, 'Algorithms and collusion', (2021) 42 *ECLR,* p.213-255, at 222, V. PEREIRA, 'Algorithm-driven collusion: pouring old wine into new bottles or new wine into fresh wineskin?', (2018) 39 *ECLR,* p.212-227, at 221.
[24] L. KAPLOW, 'Direct Versus Communications-Based Prohibitions on Price Fixing' (2011) 3 *J Legal Annal,* p.449-538.
[25] OECD, *supra* note 11, p.8.
[26] T.H. CORMEN, C.E. LESIERSON, R.L. RIVEST, C. STEIN, *Introduction to Algorithms,* 3rd ed., The MIT Press, Cambridge, Massachusetts, 2009, p.6.
[27] *Algorithms: How they can reduce competition and harm consumers*, Competition & Markets Authority, London, 2021, p.4.
[28] *Ibid.*
[29] *Ibid.*
[30] OECD, *supra* note 11, p.16.
[31] *Ibid.*

It must be stressed that algorithms can bring substantial benefits to consumers. Algorithms allow consumers to efficiently compare products and offers online, enabling them to find lower priced goods and services or those that better suit their preferences.[32] Customers benefit indirectly from the improvement in the efficiency of business processes that algorithms provide. For example, algorithms can be used by businesses to reprice thousands of products in real-time, the pricing efficiencies of which can be passed onto consumers.[33] These benefits should be taken into account when considering new approaches to combat the consumer harm caused by algorithms.

2.2. How algorithms facilitate tacit collusion

Algorithms have the potential to facilitate and enhance tacit collusion, a risk which has been recognised by many competition authorities,[34] including the Commission.[35] The Competition & Markets Authority (CMA) identifies three reasons why tacit coordination may be more likely as a result of algorithmic pricing:

(i) Market transparency

A firm must collect real-time data on its competitors to adopt algorithmic pricing. It is therefore incentivised to develop automated methods to collect and store data. Once some market actors do this, the other firms in the market have an incentive to do the same. This results in a market where all firms collect real-time data on each other and on market characteristics, making the market highly transparent.[36]

(ii) Frequency of interaction

Algorithms enable firms to reprice their products many thousands of times a day. This means that firms which are tacitly colluding using algorithmic pricing will be able to detect and punish deviations from the collusion almost immediately.[37]

(iii) Calculation of optimal price

Algorithms may be better than humans at calculating the profit-maximising tacit collusion price. They may be able to do so in instances where humans would be cognitively incapable of doing so. [38]

The OECD similarly notes that algorithms increase transparency, the velocity of business decisions, and the ability of companies to immediately respond to rivals' actions.[39] These conditions might make firms actions interdependent without the need for communication or interaction, increasing the risk of tacit collusion and leading to higher prices. [40]

2.3. Types of Algorithmic Tacit Collusion

Ezrachi and Stucke identify three main ways in which the use of pricing algorithms could result in a tacitly collusive outcome.[41] These will each be discussed in turn from

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[32] M.S. GAL, 'Algorithms As Illegal Agreements', (2021) 34 *Berkeley Technology Law Journal*, p.67-118, at 70.
[33] Competition & Markets Authority, *supra* note 31, p.5.
[34] *Algorithms and Competition*, Autorité de la concurrence & Bundeskartellamt Joint Study*,* Paris & Bonn, 2019*, Digital Ecosystems, Big Data and Algorithms: Issues Paper,* Autoridade da Concorrência, 2017.
[35] Commission Inception Impact Assessment, *supra* note 5.
[36] *Pricing algorithms Economic working paper on the use of algorithms to facilitate collusion and personalised pricing,* Competition & Markets Authority, London, 2018, p.26.
[37] *Ibid.*
[38] *Ibid.*
[39] OECD, *supra* note 11, p.34.
[40] *Ibid.*
[41] A. EZRACHI, M. STUCKE, *supra* note 12.

a legal perspective. A fair proportion of the academic literature on algorithmic tacit collusion is devoted to questioning how realistic it is that it might actually occur. I will therefore also draw from economic and computer science literature to examine this question.

2.3.1. Hub and Spoke

In US law, a traditional hub and spoke conspiracy is defined as when "a central mastermind, or 'hub', controls numerous 'spokes' or secondary co-conspirators".[42] Each spoke participates in "independent transactions with the individual or group of individuals at the 'hub' that collectively further a single, illegal enterprise".[43] Crucially, to show a single hub-and-spoke conspiracy, the competitors who form the wheel's spokes must be aware of the concerted effort to stabilise prices.[44]

An algorithmic hub and spoke is formed when an algorithm executes the hub function to facilitate collusion among competitors.[45] The classic example of this in the literature is where competitors outsource their pricing algorithms to a third party, who provides all competitors with the same or somehow coordinated algorithm.[46] The competitors' use of the same or somehow coordinated algorithm stabilises prices and dampens competition.[47] A third party could be incentivised to engage in such behaviour where it has programmed "off-the-shelf solutions" on its own initiative, it being in its interest to then sell as many as possible. Alternatively, a third party's remuneration could be proportional to the revenue its algorithm provides to the client, therefore making it more profitable for the third party to generate collusion among clients.[48]

Some academics have expressed the view that algorithmic hub and spoke scenarios pose no problems for competition authorities as they fall within the scope of Article 101 TFEU.[49] I will show that in certain scenarios, an algorithmic hub and spoke could cause a tacitly collusive outcome falling outside the scope of Article 101 TFEU.

In their report on algorithms and competition, the French and German competition authorities distinguish between competitors' *knowing* and *unknowing* use of the same or somehow coordinated algorithm.[50] Unknowing use refers to when competitors use the same or somehow coordinated algorithm developed by a third party without knowing that the other competitors are using the same algorithm (in the sense of not knowing or not being able to reasonably foresee it).[51] In order to establish an infringement of competition law, the competitors must have been aware of the third party's anticompetitive acts or at least could have reasonably foreseen them. Where this is not the case, it may be regarded as permissible parallel behaviour.[52] This is clear from the case of *Eturas and Others.*[53] Here, the ECJ considered the possible use of an online system to facilitate a hub and spoke conspiracy. The case concerned travel agencies that were all using the same online booking system provided by Eturas, the administrator of the system. Eturas posted a notice on the system declaring

[42] *United States v. Newton,* 326 F.3d 253, 255 (1st Cir. 2003).
[43] *Ibid.*
[44] A. EZRACHI, M. STUCKE, *supra* note 12, p.47.
[45] *Ibid.*
[46] Autorité de la concurrence & Bundeskartellamt, *supra* note 38, p.31.
[47] A. EZRACHI, M. STUCKE, *supra* note 12, p.47.
[48] Autorité de la concurrence & Bundeskartellamt, *supra* note 38, p.32.
[49] C.S. HUTCHINSON, G.F. RUCHKINA, S.G. PAVLIKOV, *supra* note 15, p.9.
[50] Autorité de la concurrence & Bundeskartellamt, *supra* note 38, p.32.
[51] Autorité de la concurrence & Bundeskartellamt, *supra* note 38, p.41.
[52] *Ibid.*
[53] *Eturas and Others, supra* note 3.

a newly implemented technical restriction that imposed a cap on discount rates. The Court held that a concertation between the competitors within the meaning of Article 101 TFEU could only be found if the competitors were aware of Eturas' notice.[54]
Thus, from an enforcement perspective, we see the difference between traditional hub and spoke conspiracies aimed at express facilitation of cartel activities, and the "incidental" hub and spoke effect caused by widespread adoption of a similar algorithm, which can nonetheless facilitate price alignment.[55] In the latter case, the competitors would not be aware nor could they reasonably have foreseen the third party software provider's anticompetitive intent, meaning it could be considered permissible parallel behaviour which falls outside the scope of Article 101 TFEU.
Ezrachi and Stucke offer business justifications for competitors outsourcing their pricing algorithms to third parties.[56] An upstream provider can use its and its clients' access to data to train and optimise prices. It can save time and money for a competitor to outsource this process to the third party rather than amass the data and train the algorithm itself.[57] This shows that genuine non-competitive intentions can give rise to the adoption of similar algorithms on the part of competitors.
A Wall Street Journal article details a real-world occurrence of this type of price alignment.[58] It describes the market for petrol in Rotterdam, where a number of petrol stations used the same provider of advanced analytics to determine petrol prices. The algorithm operated by the provider was tested against a control group which did not use the system to determine price. The result was that the group using the software averaged 5% higher margins.[59] This evidence that this type of collusion can occur has turned the attention of authorities towards algorithmic hub and spoke conspiracies, with the CMA taking the view that it presents the most immediate risk of algorithmic tacit collusion at present.[60] This is because all it requires is that the competitors adopt the same algorithmic pricing models, with a third party potentially acting as the "unwitting" hub.[61]
As previously stated, some academics and competition authorities have taken the view that the existing competition toolbox is sufficient to deal with incidences of algorithmic hub and spoke conspiracies. The CMA concludes this is the case "if certain criteria is met".[62] This is not contested. However, the CMA also states that it is "as yet unclear" if the existing toolbox could deal with all such cases, where "there may have not been direct contact between undertakings or a meeting of minds between them to restrict competition".[63] This is the case in the scenario described above, where there is no awareness by the spokes of the intention to engage in collusion.

2.3.2. Predictable Agent

[54] Autorité de la concurrence & Bundeskartellamt, *supra* note 38, p.37.
[55] A. EZRACHI & M.E. STUCKE, *'Sustainable and Unchallenged Algorithmic Tacit Collusion',* (2020) 17 *Northwestern Jounral of Technology & Intellectual Property,* p.217-260, at 248.
[56] *Algorithmic Collusion: Problems and Counter-Measures – Note by A. Ezrachi & M.E. Stucke,* OECD, Paris, 2017, p.10.
[57] *Ibid.*
[58] Sam Schechner, 'Why Do Gas Station Prices Constantly Change? Blame the Algorithm', Wall Street Journal, retrieved 2 May 2021, https://www.wsj.com/articles/why-do-gas-station-prices-constantly-change-blame-the-algorithm-1494262674.
[59] *Ibid.*
[60] Competition & Markets Authority, *supra* note 40, p.31.
[61] *Ibid.*
[62] Competition & Markets Authority, *supra* note 31, p.27.
[63] Competition & Markets Authority, *supra* note 40, p.33.

The predictable agent scenario (also known as the use of parallel algorithms)[64] is where each company designs and implements its own pricing algorithm to deliver predictable outcomes, for example a profit maximising strategy. The algorithm is programmed to monitor price changes and swiftly react to any competitor's price reduction. It is also programmed to follow price increases when other competitors follow in a timely manner, so that no competitor benefits from keeping prices lower.[65] Clearly, there is no prior communication between competitors in this scenario, but the fact that several or all competitors all rely on pricing algorithms might facilitate price alignment.[66]

Market transparency will likely increase where several competitors in a market adopt the same algorithm. By shifting to algorithms, the competitors increase market transparency by posting their current prices which rival algorithms will immediately see.[67] The purpose of dynamic pricing is to update prices so quickly as to reflect market demand.[68] Rival algorithms can assess and adjust their prices to this within milliseconds.[69] The speed that this allows eliminates any incentive to discount, as rivals can swiftly match the competitor's price with their algorithm. Also, the algorithms will follow price increases where sustainable. [70]

From an enforcement perspective, the predictable agent scenario is a form of pure tacit collusion.[71] Conscious parallelism takes place at both the human and machine level. While there is clearly anticompetitive intent in that the undertakings have designed the algorithms to deliver predictable outcomes, there will be no evidence of agreement.[72] At its heart is conscious parallel behaviour which, as we have seen, is legal under EU competition law.

2.3.3. Digital Eye

In the Digital Eye scenario, advances in machine learning and increases in market transparency enable self-learning algorithms to unilaterally determine the profit-maximising price, independently arriving at tacit collusion without the knowledge or intent of their human programmers.[73] The tacit coordination is the outcome of autonomous evolution, self-learning, and independent machine execution.[74] This scenario looks to future markets, where the majority of pricing decisions will be carried out by AI.[75] The type of AI in question is reinforcement learning.[76] A RL-algorithm "uses trial and error and puts over time more weight on actions in a given context that were successful in the past"[77], enabling it to self-learn the optimal strategy to enhance market transparency and thereby sustain conscious parallelism or foster price increases. According to Ezrachi & Stucke, there is a risk that digital eye dynamics

[64] C.S. HUTCHINSON, G.F. RUCHKINA, S.G. PAVLIKOV, *supra* note 15, p.3.
[65] A. EZRACHI, M. STUCKE, *supra* note 12, p.61.
[66] Autorité de la concurrence & Bundeskartellamt, *supra* note 38, p.42.
[67] A. EZRACHI, M. STUCKE, *supra* note 12, p.61.
[68] A. EZRACHI, M. STUCKE, *supra* note 12, p.62.
[69] *Ibid.*
[70] *Ibid.*
[71] J. KUPČIK, 'European tacit collusion theory and its application to price algorithms' (2020) 41 ECLR, p.533-545, at 543.
[72] A. EZRACHI, M. STUCKE, *supra* note 12, p.62.
[73] A. EZRACHI, M.E. STUCKE, *supra* note 59, p.250.
[74] A. EZRACHI, M.E. STUCKE, 'Artificial Intelligence & Collusion: When Computers Inhibit Competition' (2017) 2017 *University of Illinois Law Review*, p.1775-1810, at 1783.
[75] A. EZRACHI, M.E. STUCKE, *supra* note 59, p.250.
[76] *Ibid.*
[77] Motta, Peitz, *supra* note 109, p.26.

could also increase the instances in which tacit collusion can be achieved and sustained.[78] Non-oligopolistic markets with many players could be susceptible to tacit collusion where previously such conduct would have been unstable. This is because algorithms could be more efficient than humans in tackling behaviour of rivals, predicting their responses, punishing deviations and even decoding what types of algorithms they are using.[79]
Humans are far-removed from the tacit collusion of algorithms under the Digital Eye scenario. There is no evidence of communication nor even an intention to collude. The competition toolbox is near empty in tackling this type of algorithmic tacit collusion, leading to questions as to whether a new standard for intervention is required.

2.4. Caveats

I have so far outlined the theoretical possibilities of algorithmic tacit collusion occurring. However, a number of caveats must be expressed regarding the plausibility of it occurring in reality.
Firstly, for algorithmic tacit collusion to occur a sufficiently large proportion of firms operating in the relevant market must be using pricing algorithms.[80] In the hub and spoke context, a sufficiently large proportion must have adopted the third party's software for the structure to be able and to have the incentive to fix prices.[81] Equally, the predictable agent scenario relies on a number of firms using pricing algorithms for the tacit collusion to be sustainable.[82]
The precise extent to which pricing algorithms are used in the real world is uncertain, with estimates varying between studies. Chen analysed third party sellers on Amazon and found that 543 out of approximately 33,000 that they regarded as very likely to be using pricing algorithms.[83] The Commission's 2017 E-commerce Sector inquiry found that approximately 53% of respondent retailers track online prices of competitors and 67% of them use automatic software for that purpose. 78% of those retailers that use software to track prices subsequently adjust their own prices.[84]
Following its e-commerce sector inquiry, the Commission opened an investigation into the fixing of online resale prices by four consumer electronics manufacturers.[85] It found that the manufacturers engaged in fixed or minimum resale price maintenance by restricting the ability of their online retailers to set their own retail prices. The Commission also found that because many of the retailers were using pricing algorithms that automatically adapted their prices to those of competitors, the retail "pricing restrictions imposed on low pricing online retailers typically had a broader impact on overall online prices for the respective consumer electronic products."[86] This is an illustration of the algorithmic tacit collusion effect, in the sense that the other

[78] A. EZRACHI, M. STUCKE, *supra* note 12, p.76.
[79] A. EZRACHI, M. STUCKE, *supra* note 12, p.77.
[80] Competition & Markets Authority, *supra* note 40, p.27.
[81] *Ibid.*
[82] Competition & Markets Authority, *supra* note 40, p.3.
[83] L. CHEN, A. MISLOVE, C. WILSON, 'An empirical analysis of algorithmic pricing on Amazon Marketplace' (2016) *Proceedings of the 25th International Conference on World Wide Web,* p.1339-1349, at 1340.
[84] *Final Report on the E-commerce Sector Enquiry,* European Commission, Commission Staff Working Document, Brussels, 2017, p.51.
[85] European Commission - Press Release, 'Antitrust: Commission fines four consumer electronics manufacturers for fixing online resale prices', 24 July 2018, retrieved 01 May 2021, https://ec.europa.eu/commission/presscorner/api/files/document/print/cs/ip_18_4601/IP_18_4601_EN.pdf.
[86] *Ibid.*

prices in the market converged towards the restricted price because of the use of algorithms.[87]

Many market platforms, such as eBay and Amazon also offer tools and algorithms to their users in order to set prices.[88] Some even go as far as directly setting prices on behalf of the users.[89] This raises concerns that these types of practices could give rise to *supra*-competitive prices via a hub and spoke structure or parallel use of individual algorithms.

Some software companies now advertise pricing algorithms for businesses as a means to avoid price wars and increase prices and margins. The Italian competition authority observed that "a number of specialised software developers offer solutions that allow even small companies to implement strategic dynamic pricing strategies, offering tools to auto-detect pricing wars as well as to help drive prices back up across all competition."[90] This further indicates that use of pricing algorithms is likely becoming more widespread across all industries.

However, there is another potential impact of this expansion which could hinder the sustainability of tacit collusion. Academics have argued that the more algorithms at work on the market, the less likely tacit collusion is to occur. Schwalbe gives the view that different pricing software firms compete in the upstream market for the custom of firms in the downstream market.[91] Each has an incentive to provide the superior solution for customers, which implies difference in the algorithms offered, in how they observe and learn. Algorithms also contain stochastic elements for exploring the environment, which further differentiate how they function.[92] This raises doubt as to the ability of the algorithms to converge to a stable profit-maximising price.

It has been noted that industry-wide use of the same collusive algorithm should in theory make algorithmic tacit collusion easier. However, Schwalbe[93] and Deng[94] argue that one would expect a firm's algorithm to incorporate firm-specific information in its decision-making process. Furthermore, each firm would likely customise the algorithm to suit their own needs.[95] Therefore, even if the firm's algorithms have the same core structures and capabilities, this may not necessarily mean that prices will converge.

Ezrachi and Stucke state that algorithmic tacit collusion will only affect a small number of markets where certain market conditions are present.[96] While algorithms will likely change some characteristics and make markets more susceptible to tacit collusion, scholars are quick to point out that they provide no solution to numerous problems which plague human-facilitated coordination. These include lack of information on rivals' business strategies, input prices and demand forecasts.[97]

The predictable agent scenario relies on the ability to design algorithms that are capable of tacitly colluding in realistic situations. This could be a challenging technical problem in reality, a finding that emerged from a study by Crandall et al.[98] It found that

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[87] A. EZRACHI & M.E. STUCKE, *supra* note 59, p. 250.
[88] Competition & Markets Authority, *supra note 31*, p.31.
[89] *Ibid.*
[90] *Algorithms & Collusion – Note from Italy,* OECD, Paris, 2017, p.3.
[91] U. SCWALBE, 'Algorithms, Machine Learning, and Collusion', (2019) 14 *Journal of Competition Law & Economics*, p.568-607, at 573.
[92] *Ibid.*
[93] *Ibid.*
[94] A. DENG, 'What Do We Know About Algorithmic Tacit Collusion?', (2018) 33 *Antitrust,* p.88-95, at 92.
[95] *Ibid.*
[96] A. EZRACHI, M.E. STUCKE, *supra* note 59, p. 226.
[97] M.S. GAL, *supra* note 36, p.90.
[98] J.W. CRANDALL et al, 'Cooperating with machine' (2018) *9 Nature Communications,* Article no. 33.

the algorithm must be able to learn to cooperate with others without necessarily having prior knowledge of their behaviours. The speed of learning is also important, and an algorithm that takes an unrealistically long time to collude is of little relevance to the antitrust community. The study concluded that these challenges often cause algorithms to defect rather than to cooperate.[99]

2.5. Evidence

Despite these valid caveats concerning the plausibility of algorithmic tacit collusion, there is now empirical evidence of it having occurred. A study by Assad et al[100] examined the German retail gasoline market, where algorithmic-pricing software became widely available by mid-2017. It found that, after the adoption of algorithms, margins increase by 9% in non-monopoly markets, where there is local competition. In duopolies, market-level margins do not change when only one of the two petrol stations adopt pricing algorithms, but increase by 28% in markets where both do.[101] They therefore conclude that the adoption of pricing algorithms facilitates tacit collusion. However, the study does not identify which algorithms the petrol stations adopt, so it is not known whether their results come from multiple stations in a market adopting the *same* or *different* algorithms.[102] They could therefore pertain to either a hub and spoke or a predictable agent scenario.[103]

The results of this study have been acknowledged by competition authorities.[104] In their expert advice to the Commission for the impact assessment of a New Competition Tool, Motta & Peitz state that algorithmic tacit collusion can occur, and that the discussion is now asking how plausible it is depending on the market environment.[105] Algorithmic tacit collusion should therefore be a genuine issue of concern for competition authorities, at least in the hub and spoke or predictable agent scenario. As shown, this type of collusion can fall outside the scope of the current competition toolbox. This justifies consideration of new approaches to tackle algorithmic tacit collusion.

When it comes to the Digital Eye scenario, there is no empirical evidence of its occurrence. The only evidence that self-learning algorithms are capable of autonomously reaching a collusive outcome comes from experimental settings.[106] Where these experiments have shown capability of self-learning algorithms to autonomously collude, the results have been downplayed by academics who doubt that this outcome could occur in real-world scenarios.[107]

A 2020 study by Calvano et al showed that Q-learning algorithms (a simple form of reinforcement learning algorithm) competing in simulations can learn to achieve a collusive outcome, with punishment for deviation.[108] They conclude that they learn to collude purely by trial and error, with no prior knowledge of the environment in which

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[99] *Ibid.*
[100] S. ASSAD et al, *supra* note 4.
[101] S. ASSAD et al, *supra* note 4, p.40.
[102] *Ibid.*
[103] *Ibid.*
[104] Competition & Markets Authority, *supra note 31*, p.33.
[105] Massimo Motta, Martin Peitz, 'Intervention triggers and underlying theories of harm; Expert advice for the Impact Assessment of a New Competition Tool; Expert study', European Commission, 2020, retrieved 27 April 2021, https://ec.europa.eu/competition/consultations/2020_new_comp_tool/kd0420575enn.pdf, p.26.
[106] *Ibid.*
[107] A. ITTOO, N. PETIT, "Algorithmic Pricing Agents and Tacit Collusion: A Technological Perspective", in H. JACQUEMIN, A. DE STREEL (eds.), *L'intelligence artificielle et le droit,* Bruxelles: Larcier, 2017, p.241-256.
[108] E. CALVANO et al, 'Artificial Intelligence, Algorithmic Pricing and Collusion', (2020) 110 *American Economic Review,* p.3267-97.

they operate, without communicating with one another, and without being specifically designed or instructed to collude.[109] However, one caveat regarding this study is that it took numerous iterations before the algorithms learned to tacitly collude.[110] Furthermore, there are numerous other assumptions that these experiments rely on, meaning that their results cannot be directly transposed to real-world environments.[111] Nevertheless, the Calvano study can be seen as proof that in principle a particular class of algorithms are able to learn to collude in the "wild" and this includes stochastic market environments.[112] Many more rigorous studies are needed before we can conclude as to the realistic plausibility of the Digital Eye scenario in real-world markets. For now, one can only conclude that it is theoretically possible for self-learning algorithms to autonomously reach a tacit collusion strategy.

Some academics refer to the lack of real-world cases of algorithmic collusion to resist suggestions of a new approach to tackle the issue. A number of points can be made to counter this. Firstly, it is safe to assume that the use of algorithms will only become more widespread in the future, which will increase the likelihood of algorithmic collusion occurring. Indeed, just because there have been no legal cases of algorithmic tacit collusion does not mean that it is not occurring. It is entirely possible that the lack of cases is due to an increased ability to evade detection of collusion by use of algorithms.[113] Lastly, it is important to bear in mind that none of the instances of algorithmic tacit collusion outlined thus far are a fiction; they are a genuine concern and research in both real-world and experimental settings has shown that they can occur. It is true that more information is needed about how pricing algorithms work and how they impact competition, a point which will be addressed in more detail below. Nevertheless, algorithmic tacit collusion is a very real concern for competition policy and authorities should begin to seriously consider approaches to tackle it.

3. How to deal with algorithmic tacit collusion

3.1. Expansion of the existing toolbox?

The academic literature generally concludes that there are many instances of collusion involving algorithms which can fall within the scope of the existing competition rules. This is not contested. The discussion thus far has been limited to scenarios that would fall outside the scope of the existing rules. Nevertheless, there are numerous concepts in the existing toolbox that many argue could be expanded upon or reinterpreted to catch instances of algorithmic tacit collusion.

3.1.1. Collective Dominance

The concept of collective dominance under Article 102 has been suggested as a means of tackling tacit collusion that could be extended to algorithms. The concept was confirmed in *Italian Flat Glass*[114] and provides that it is possible that two or more

[109] E. CALVANO et al, *supra note 113,* p.3269.
[110] A. EZRACHI, M.E. STUCKE, *supra* note 59, p.255.
[111] Autorité de la concurrence & Bundeskartellamt, *supra* note 38, p.45.
[112] Motta, Peitz, *supra* note 109, p.26.
[113] T. Klein, '(Mis)understanding Algorithmic Collusion', CPI Antitrust Chronicle, July 2020, retrieved 16/04/2021, https://dev.competitionpolicyinternational.com/wp-content/uploads/2020/07/8-Misunderstanding-Algorithmic-Collusion-Timo-Klein.pdf.
[114] Joined cases T-68/89, T-77/89 and T-78/89 *Società Italiana Vetro SpA, Fabbrica Pisana SpA and PPG Vernante Pennitalia SpA v Commission of the European Communities* [1992] ECR II-1403, para. 358.

independent economic entities on a specific market who are united by economic links could together hold a dominant position vis-à-vis the other operators on the same market.
It has been suggested a group of undertakings tacitly colluding by using the same algorithms could be considered as holding a collectively dominant position. However, even if this were possible, this would only be half the battle, as to be guilty of breaching Article 102 TFEU it is necessary to prove *abuse* of this dominant position. This has proven difficult under the concept of collective dominance. Excessive pricing amongst a collectively dominant entity by using algorithms could constitute abuse of a collectively dominant position.[115] However, at what point does pricing become excessive? Whish and Bailey note that the Commission does not want to establish itself as a price regulator and so would be reluctant to intervene in such a case.[116] Furthermore, the price increase caused by pricing algorithms would be gradual, so it would be difficult to recognise it as excessive.[117]

3.1.2. Facilitating Practices

Legal scholars have also proposed a solution that relies on circumstantial evidence to prove competition law infringements. It has been suggested that a pricing algorithm could be considered a "facilitating practice".[118] Under EU law, a facilitating practice is "conduct by firms, typically in an oligopolistic market which does not constitute an explicit "hardcore" cartel agreement, and helps competitors to eliminate strategic uncertainty and coordinate their conduct more effectively."[119] Although Article 101 TFEU does not cover parallel behaviour, it can be applied differently to tackle such issues by using facilitating practices.
In *Woodpulp II*[120] the idea emerged that even if tacit collusion in an oligopoly did not fall within the scope of Article 101 TFEU, it should be triggered where a practice artificially facilitates collusion.[121] The ECJ has recognised information exchanges between undertakings in an oligopoly as a facilitating practice that could infringe Article 101 TFEU.[122] Information exchanges increase the transparency of the market and so make parallel behaviour easier. It has been argued that the same can be said for the use of algorithms and that they too could be treated as facilitating practices.
Ong suggests that the concurrent use of surveillance and price-adjustment algorithms, along with calculated online disclosures of business data that may convey pricing signals to each other, could be regarded as facilitating practices. Where there is evidence that these facilitating practices replace price competition with sub-competitive price parallelism, which is intended by the competitors via the use of algorithms, there may be room for this to fall within the concept of concerted

[115] Imposing unfair prices is an abuse under Article 102(a) TFEU.
[116] R. WHISH, D. BAILEY, *supra* note 8, p.581.
[117] J. KUPČIK, *supra* note 75, p.543.
[118] C. GONZALEZ VERDUGO, 'Horizontal restraint regulations in the EU and the US in the era of algorithmic tacit collusion', (2018) 7 *UCL J.L and J.*, p.114-141, at 138.
[119] *Facilitating Practices in Oligopolies*, OECD, Paris, 2007, p.9.
[120] *A Ahlström Oy v Commission, supra note 31*.
[121] N. PETIT, "The Oligopoly Problem in EU Competition Law" in I. LIANNOS, D. GERADIN, *Research Handbook in European Competition Law,* Edward Edgar, 2013, p.284.
[122] Case T-53/03 *BPB v Commission* [2008] ECR II-1333, paras 108-109.

practice.[123] This approach relies on the authorities taking advantage of the doctrinal elasticity of the concept of concerted practice.[124]
Gonzalez Verdugo takes the view that there is scope in the current regulation of information exchanges to undertake enforcement in an algorithmic tacit collusion case, where the necessary collusion-facilitating features are found in the algorithms used by the firms.[125] The algorithm could be understood as facilitating the collusion and because they are fed with information they receive on the market, it could be considered an exchange of information.[126]
There are a number of doubts regarding these approaches. Firstly, legal assessment of the use of facilitating practices to tackle problems of parallel behaviour is still generally ambiguous.[127] Secondly, Article 101 TFEU applies to reciprocal contact between competitors, thus the facilitating practice would have to include a link to another competitor.[128] Thirdly, it is doubtful that the feeding of information received on the market to algorithms would be considered an exchange of information, since in the three scenarios outlined above, the information would be publicly available on the market. It would not be a communication and it could not be considered a form of contact sufficient to give rise to a concerted practice.[129] Lastly, the standard of proof fostered by indirect evidence can be rebutted by undertakings if they can prove the existence of circumstances which cast the established facts implying the existence of an infringement in a different light and allow another plausible explanation for them.[130]
While many academics correctly suggest that the concept of concerted practice is in theory flexible enough to capture some cases of algorithmic tacit collusion, they ignore the point I previously outlined: the level of evidence that would be required to prove that something more than mere parallel conduct has occurred.
None of the above approaches change the important net point that is almost universally recognised in the literature: some cases of algorithmic tacit collusion cannot be tackled using the existing toolbox. No approach in the literature would cover the hub and spoke, predictable agent and digital eye scenarios outlined above, save with radical reinterpretation of existing concepts. This is reflected in the fact that recently, EU national competition authorities with experience of algorithmic collusion expressed that the existing framework is not suitable and effective to address all scenarios of algorithmic collusion.[131] This reality justifies consideration of alternative approaches to combatting algorithmic tacit collusion.

3.2. Towards a New Approach

3.2.1. Information

[123] B. ONG, 'The Applicability of art.101 to horizontal algorithmic pricing practices: two conceptual frontiers', (2021) 52 *International Review of Intellectual Property and Competition Law*, p.189-211, at 203.
[124] *Ibid.*
[125] C. GONZALEZ VERDUGO, *supra* note 123, p.138.
[126] *Ibid.*
[127] C. GONZALEZ VERDUGO, *supra* note 123, p.137.
[128] *Ibid.*
[129] B. ONG, *supra* note 128, p. 203.
[130] V. DAN ROMAN, 'Digital markets and pricing algorithms - a dynamic approach towards horizontal competition' (2018) 39 *ECLR,* p.37-45, at 44.
[131] 'Summary of the contributions of the National Competition Authorities to the impact assessment of the new competition tool', European Commission, 2020, retrieved 1 May 2021, https://ec.europa.eu/competition/consultations/2020_new_comp_tool/summary_contributions_NCAs_responses.pdf.

There are still many unknowns regarding algorithmic tacit collusion. There have been no legal cases involving it, and all the evidence of it having occurred comes from academic studies. This points to one basic conclusion: there is a need for more information about algorithms, how they work and how they affect competition. This has been highlighted by enforcement agencies themselves[132] and by academics[133]. The CMA identifies the importance of having strong information gathering powers to enable authorities to carry out their functions in the digital economy. It considers them essential to effective monitoring and investigation of algorithmic systems.[134] It even recommends that the government consider granting it additional information gathering powers to enable it to effectively investigate algorithms.[135]
If authorities have strong information gathering powers, they could use the information gathered to analyse the algorithm and assess its effects on competition. The CMA suggests that numerous theories of harm associated with algorithmic collusion could be analysed by collecting or simulating appropriate data for use as input into a given algorithmic system and then analysing the output.[136] Where the authority has direct access to the data and the algorithm, more comprehensive audits could be carried out.[137] Ezrachi and Stucke suggest that authorities could begin conducting experiments with pricing algorithms using an "algorithmic collusion incubator".[138] This would involve examining the pricing algorithms on the market and then using the data and algorithms to run simulations to test what conditions would make tacit collusion easier and more durable. They acknowledge that such an incubator would be imperfect, but it could help the agencies understand what factors are worth exploring to destabilise collusion.[139] Sonderegger suggests developing a computer programme which recognises whether price changes between competitors are made in such a way that only algorithms would be able to adapt them so quickly and on a regular basis.[140] She notes that in a similar vein, the Korean Fair Trade Commission apply artificial intelligence in order to more successfully detect anti-competitive conduct. [141]

3.2.2. Technological Expertise

This is linked to another recommendation that consistently emerges from the literature: the need for competition authorities to develop their technological expertise. Authorities need to understand these technologies to develop legal initiatives to tackle their anticompetitive effects. To this end, the CMA have recruited data scientists and engineers, technologists, and behavioural scientists as part of its Data, Technology and Analytics team to develop new analytical and investigative techniques and to broaden its range of evidence and intelligence.[142] They have used these new capabilities to "monitor businesses and markets, to gather and pursue potential leads,

[132] Competition & Markets Authority, *supra note 31*, p.48.
[133] S. LEWIS, D. RIDYARD, 'Automatic harm to competition? Pricing algorithms and co-ordination' (2018) 39 *ECLR* p.341-344, at 343.
[134] Competition & Markets Authority, *supra note 31*, p.48.
[135] *Unlocking digital competition Report of the Digital Competition Expert Panel,* Competition & Markets Authority, London, 2021, p.112.
[136] Competition & Markets Authority, *supra note 31*, p.35.
[137] Competition & Markets Authority, *supra note 31*, p.39.
[138] OECD, *supra* note 60, p.28.
[139] *Ibid.*
[140] G. SONDEREGGER, *supra* note 27, p.223.
[141] *Ibid.*
[142] Competition & Markets Authority, *supra note 31*, p.50.

to assist our conduct of formal investigations, and to design and implement effective remedies."[143] The EU would do well to do the same.

3.2.3. Sector Inquiries

The EU has strong investigative powers at its disposal in the form of sector inquiries. These are investigations that the European Commission carries out into sectors of the economy where it believes a market is not working as well as it should and that breaches of competition rules might be a contributory factor. After a sector inquiry, the Commission may follow up on the information gathered with enforcement action.[144] In the context of algorithms, a sector inquiry could allow the Commission to examine how algorithms result in coordinated effects and under which circumstances algorithmic collusion is more likely to be observed.[145] It could help them understand the dynamics in algorithm-driven markets and the extent of any competition problems.[146] The Commission's E-Commerce sector inquiry serves as a good example of how sector inquiries can help identify competition concerns arising from algorithmic pricing. Among its main findings, it found that companies increasingly use pricing software that adjust their prices based on the observed prices and competitors. The report concluded that the use of such software may in some situations, depending on the market conditions, raise competition concerns. [147]

3.2.4. Market Investigation Tool

The Commission does not have any specific enforcement powers in the framework of a sector inquiry. It can decide to pursue a formal investigation on foot of information gathered during a sector inquiry, however investigations can take many years, at which point much consumer harm may have already taken place. Some jurisdictions possess a market investigation tool, which allows authorities to go beyond merely studying markets and impose behavioural and structural remedies.[148] One such jurisdiction is the UK, where behavioural and structural remedies have been imposed in the past to restore competition to markets suffering from structural competition problems. This type of tool offers a degree of flexibility in restoring competition in the market that would not be possible through other means.[149] Many academics and enforcement agencies have recognised the usefulness of such a tool in intervening in markets susceptible to algorithmic tacit collusion and imposing behavioural and structural remedies to restore competition. It is therefore unsurprising that the Commission considered adopting a competition tool like this. It identified markets suffering from a "structural lack of competition" as a target area for such a tool, using as an example oligopolistic markets which have become more transparent as a result of algorithm-based technologies.[150]

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[143] Competition & Markets Authority, *supra note 31*, p.51.
[144] 'Sector Inquiries', European Commission, retrieved on 20 April 2021, https://ec.europa.eu/competition/antitrust/sector_inquiries.html.
[145] OECD, *supra* note 11, p.40.
[146] *Ibid.*
[147] European Commission, *supra* note 88, p.5.
[148] OECD, *supra* note 11, p.40.
[149] *Ibid.*
[150] Commission Inception Impact Assessment, *supra* note 5.

4. New Competition Tool

4.1. Design & Operation

The proposal for a NCT stemmed from the objective of making competition policy fit for the modern economy and strengthening enforcement in all sectors.[151] It occurred alongside the proposal for a new *ex ante* regulatory instrument for large online platforms, which has now become the draft DMA.[152] In June 2020, the Commission published its Inception Impact Assessment (IIA) on the NCT and opened its public consultation on the new tool, inviting feedback from stakeholders.[153] It identified the NCT as a means of addressing gaps in the current EU competition rules and allowing for timely and effective intervention against structural competition problems that cannot be sufficiently tackled under the existing rules. One such problem is a structural lack of competition, referring to markets with existing structural failures, such as oligopolistic structures with an increased risk of tacit collusion. These included markets featuring increased transparency due to algorithm based technological solutions, which it noted were becoming increasingly prevalent across all sectors. [154]
The IIA provides four options for the design of the tool,[155] with the Expert report by Motta and Peitz eventually recommending a market-structure based tool with a horizontal scope applicable across all sectors.[156] It would consist of a market investigation instrument which would allow the Commission to identify and remedy structural competition problems that could not be addressed under the existing competition rules. It would be based on a test allowing the Commission to intervene when a structural risk for competition or a structural lack of competition prevents the internal market from functioning properly.[157] The tool would enable the Commission to impose behavioural and where appropriate, structural remedies. There would be no infringement, no fines and no damage claims.[158] The expert report by Schweitzer envisioned proceedings of a more administrative nature, which would be more participative and with less of an adversarial style of interaction between the Commission and the undertakings concerned than in proceedings under Article 101 or 102 TFEU.[159]
Motta and Peitz felt that a dominance-based tool or a tool limited in scope of application to just digital markets would be inferior options, as the theories of harm they identified included narrow oligopolies or markets at risk of moving towards dominance, and theories of harm not exclusive to digital markets.[160] The Commission itself appeared to favour a wide scope for the tool. The IIA noted that some of the theories of harm identified apply to all sectors, not just digital ones.[161] Commission

[151] *Ibid.*
[152] Commission Proposal for a Digital Markets Act, *supra* note 6.
[153] *Ibid.*
[154] *Ibid.*
[155] *Ibid.*
[156] Motta, Peitz, *supra* note 109, p.50.
[157] Commission Inception Impact Assessment, *supra* note 5.
[158] *Ibid.*
[159] Heike Schweitzer, 'The New Competition Tool: Its institutional set-up and procedural design; Expert report', (2020), European Commission, retrieved 27 April 2021, https://ec.europa.eu/competition/consultations/2020_new_comp_tool/kd0420574enn.pdf, p.6.
[160] Motta, Peitz, *supra* note 109, p.50.
[161] Commission Inception Impact Assessment, *supra* note 5.

officials equally expressed that the tool should apply to the entire economy with Director General Guersent noting that all markets will eventually become digital.[162]
In terms of how the tool would operate, the expert report conceived it as comprising both a full-fledged investigatory phase and an exploration of potential remedies.[163] The first stage would be an initial informal scoping phase. It would take the form of a preliminary non-public investigation that would collate all the market information available and discuss the existence of a competition problem to be addressed by the NCT. At the end of this phase, the Commission would decide to either dismiss the suspected competition concerns, to open an infringement proceeding, or to open an NCT proceeding.[164] The second stage would be the publication of an opening decision, which would provide a rough sketch of the potential competition problem to be explored.[165] The form of the third stage would depend on whether remedies were envisioned for a selected group of undertakings, or the entire market. In both cases there would be distinct evidence gathering phases and consultations with undertakings during the process, including discussions on potential remedies. For the evidence gathering phases, the report recommended that the Commission be endowed with the full set of investigative powers that it would have in an infringement proceeding or sector inquiry.[166]
The report also suggests a number of options to promote a timely intervention. This was one of the goals of the NCT, in order to prevent competition problems becoming so entrenched that they are difficult to remedy. To this end it suggests having binding deadlines, importing information from other EU proceedings and information exchange with NCAs, and complementing investigative powers with a duty to cooperate.[167]
The proposed NCT would have functioned differently from the UK tool in two main respects. Firstly, the NCT was not envisioned to function as a second phase to a preceding phase 1 investigatory proceeding, like that of the UK tool, which follows up on a market study.[168] However, deployment of the NCT could follow from a sector inquiry, in which case an investigation might be able to proceed more quickly.[169] Secondly, the UK tool integrates analysis and discussion of the potential competition problem and potential remedies from the start. The NCT on the other hand would make a preliminary opening decision and only after further investigation into the market through the first evidence gathering phases would discussion of potential remedies begin. The logic here is that it does not make sense to consider potential remedies until the competition problem is specified and verified. Further investigations can also change the understanding of the competition problem and it is important that provision be made for the possibility to modify the scope of the NCT proceedings.[170] Nevertheless, the principle of the two tools is the same: the ability to carry out an investigation of a market that is suffering from structural competition problems and to impose behavioural and structural remedies.

4.2. Tackling Algorithmic Tacit Collusion

[162] Olivier Guersent Speech to the 24th Annual Competition Conference, International Bar Association, 8 September 2020.
[163] Schweitzer, *supra* note 164, p.18.
[164] Schweitzer, *supra* note 164, p.19.
[165] *Ibid.*
[166] Schweitzer, *supra* note 164, p.20.
[167] Schweitzer, *supra* note 164, p.23-30.
[168] Schweitzer, *supra* note 164, p.20.
[169] Schweitzer, *supra* note 164, p.13.
[170] Schweitzer, *supra* note 164, p.20.

As previously stated, the Commission highlighted algorithmic tacit collusion as a potential target for the NCT. The expert report explains its potential usefulness in dealing with algorithmic tacit collusion, stating that it is a "promising approach to generate evidence whether in a particular sector decentralised pricing leads to *supra*-normal prices."[171] Furthermore, the Report by the Economic Advisory Group on Competition Policy acknowledged the usefulness of the NCT in handling algorithmic tacit collusion as an extension of its usefulness in tackling tacit collusion in the general sense. [172] It referred to case studies of the UK tool as an example. In 2014 the CMA launched a market investigation into the cement industry and found evidence of tacit collusion. It imposed two types of remedies: firstly, it imposed a structural remedy of the divestiture of production capacity of a new competitor; secondly, it imposed the behavioural remedy of banning generic price announcements by firms. The report takes the view that this represents convincing evidence of the merits of the UK tool.[173] The CMA indicates the type of remedies it could impose after a market investigation in cases involving algorithms. It may:

- Require a firm to disclose detailed information to regulators to cooperate with testing and inspection, including providing access to user data and internal communications on the design and maintenance of the algorithmic system;
- Impose ongoing monitoring requirements and require firms to submit compliance reports;
- Require firms to make certain changes to the design and operation of algorithms.[174]

Academics have further contributed to this debate by suggesting remedies that could be imposed following a market investigation. Pereira suggests obliging undertakings to meet specific surveillance system or IT requirements such as reducing the frequency with which companies may adjust prices.[175] This should counterbalance automatic pricing and induce competitors to drop their prices below the collusive level, knowing that other competitors could not instantly do the same.[176]

Notwithstanding its perceived benefits, a market investigation tool attracts some criticism. It has the potential to be very powerful and flexible and can impose remedies that are quite interventionist.[177] Structural remedies in particular can have severe consequences for undertakings. In their position paper on the NCT, the ETNO-GSMA expressed that structural remedies should only be considered as a last resort and felt they would be disproportionate in circumstances where no infringement of competition law would need to be demonstrated.[178] This view is understandable. An order for divestment of a company seems far-reaching for conduct that would not even constitute a violation of competition law. Schweitzer recognised this in his expert report and stated that structural remedies would need to comply with necessity and proportionality and that the Commission would need to show that no other remedy is available that is less intrusive but likely to be equally effective.[179]

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[171] Motta, Peitz, *supra* note 109, p.26.
[172] Gregory S. Crawford, Patrick Rey, Monika Schweitzer, 'An Economic Evaluation of the EC's Proposed "New Competition Tool"', (2020), European Commission, https://ec.europa.eu/competition/consultations/2020_new_comp_tool/kd0320680enn.pdf, p.14.
[173] *Ibid.*
[174] Competition & Markets Authority, *supra note 31*, p.48.
[175] V. PEREIRA, *supra* note 27, p.223.
[176] *Ibid.*
[177] A. FLETCHER, '*Market Investigation for Digital Platforms: Panacea or Complement',* (2020) Centre for Competition Policy University of East Anglia Working Paper 20-06, p.9.
[178] *ETNO-GSMA Position Paper on a New Competition Tool,* September 2020, retrieved on 20 April 2021, https://etno.eu/component/attachments/attachments.html?id=7802&task=download.
[179] Schweitzer, *supra* note 164, p.37.

Schweitzer also took the view that a behavioural remedy could be equally severe for a company if it restricted its strategic choice over a long period of time.[180] Behavioural remedies can also be difficult to monitor. In the end, behavioural remedies would need to be assessed by the Commission on a case-by-case basis.[181] Equally, a tool with the potential to be as powerful as this would need to be subject to strong procedural checks and balances.[182]

A market investigation tool would have clear benefits in combatting algorithmic tacit collusion. It would facilitate understanding of the impact of algorithms on the market, which has been identified as crucial in adopting an appropriate strategy towards algorithmic tacit collusion. Moreover, it would do so in a less adversarial setting than an investigation, one which is based on cooperation, and where there is no oppressive influence exerted by threat of fines or liability. It is true that a sector inquiry would also be useful in gathering information about algorithmic tacit collusion. However, the fact that there is no enforcement option detracts from its usefulness. A formal investigation that might result from it is adversarial and very time consuming. It is the flexibility in having the option to directly impose remedies for algorithmic tacit collusion in a timely manner based on the information gathered which makes a market investigation tool so much more effective. Examples of effective remedies would be reducing the frequency with which companies may adjust prices, limiting price disclosures, imposing design and operation changes to algorithms so they do not collude and, where they are necessary and proportionate, structural remedies.

4.3. Digital Markets Act

In December 2020 the Commission published its legislative proposal on foot of the consultations it carried out for both the NCT and the new ex ante regulation for large digital platforms. It is entitled the Digital Markets Act and imposes obligations on large core platform services known as gatekeepers.[183] In the current legislative proposal, the market investigation tool has been substantially pared back. It is no longer a standalone measure but would rather be used effectively to manage and enforce the existing gatekeeper rules.[184] The fact that its scope has been substantially pared back renders it useless in tackling algorithmic tacit collusion in the manner initially envisioned.

The main reason why the NCT was pared back is because in the public consultations, respondents felt that the problems identified pertained mostly to digital markets, and there was not strong support for a new standalone tool applicable to all markets. This outcome is best summed up by the explanations of the views of respondents on the available policy options.[185] Most emphasised that there was a need for a combined approach of the suggested options, the combination most referred to being that of an ex ante set of rules, in addition to a flexible intervention tool.[186] The report states that there was consensus on an instrument covering digital markets, while only some respondents explained that they supported an NCT applicable to all markets. The

[180] *Ibid.*
[181] *Ibid.*
[182] FLETCHER, *supra* note 182, p.1.
[183] Commission Proposal for a Digital Markets Act, *supra* note 6.
[184] Commission Proposal for a Digital Markets Act, *supra* note 6, Section IV.
[185] 'Factual summary of the contributions received in the context of the open public consultation on the New Competition Tool', European Commission p.26, retrieved 24 April 2021, https://ec.europa.eu/competition/consultations/2020_new_comp_tool/summary_stakeholder_consultation.pdf.
[186] *Ibid.*

policy approach that was most referred to by respondents is the approach that emerged in the draft DMA: ex ante rules for gatekeepers along with a market investigation tool limited in scope to enforcing and managing the gatekeeper obligations.[187]

Therefore, the decision to pare back the NCT is understandable and justifiable on the basis of the public consultations. The Commission has targeted the area that was of most concern to respondents: structural problems in digital markets associated with large platforms. It is also interesting to note the views of respondents on tacit collusion and pricing algorithms. The majority of respondents felt that tacit collusion can be tackled by Articles 101 and 102 TFEU.[188] This is misguided in my view. On pricing algorithms, respondents felt that using them can lead to competition concerns in the form of an alignment of prices and less competition between market players. Respondents agreed that the Commission should be able to intervene in markets where pricing algorithms are prevalent to preserve/improve competition, but the majority felt that the existing competition law framework is sufficient to do so.[189] This may reflect the fact that all legal cases of algorithmic collusion thus far have involved explicit collusion and were tackled using the existing toolbox. The risk of algorithmic tacit collusion is less known and is probably not seen as a real danger by stakeholders. After all, there is still very little evidence of it.

While the Commission may have identified a wider market investigation tool as a useful means of tackling algorithmic tacit collusion, it could be argued that it is difficult to justify the adoption of such a tool on this basis, considering stakeholders did not feel the need for a new tool to combat algorithmic collusion, and the shortage of evidence of algorithmic tacit collusion having occurred in real-world scenarios. In a response to the NCT generally, Handelversband Deutschland called for more convincing justification of such an entirely new and far-reaching instrument. This reflects the importance from a policy perspective of clearly demonstrating a competitive problem and a specified instrument that would fix it.[190] It may be the case that algorithmic tacit collusion has not quite reached the level where it could be considered a clear competition problem, given the lack of evidence of it. It may be more a concern for the future.

Technology moves quickly, and all indications suggest that algorithms will only become more widespread. It could be that in a few years, algorithmic tacit collusion will be acknowledged as a more pressing and immediate concern. Perhaps the broad market investigation tool as initially envisioned has only been shelved for the time being, and could emerge again in the future, when a greater need for it is perceived. If that were to be the case, how should the Commission proceed?

5. A Market Investigation Tool in the future?

One issue that emerged from the public consultations that could have an impact on potential future considerations of a market investigation tool is legal basis.[191] Some

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[187] *Ibid.*

[188] 'Factual summary of the contributions received in the context of the open public consultation on the New Competition Tool', *supra* note 190, p.13.

[189] *Ibid.*

[190] 'Single market – new complementary tool to strengthen competition enforcement, Feedback from: Handelsverband Deutschland', European Commission, retrieved 24 April 2021, https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12416-New-competition-tool/F535416.

[191] 'Factual summary of the contributions received in the context of the open public consultation on the New Competition Tool', *supra* note 190, p.16.

respondents raised the question whether there is a sufficiently clear legal basis to justify the adoption of an NCT addressing structural competition problems outside the reach of Articles 101 and 102 TFEU.

5.1. Legal Basis

5.1.1 Article 103 TFEU

The proposed legal basis for the NCT was Article 103 TFEU in combination with Article 114 TFEU.[192] Article 103(1) TFEU empowers the Council to adopt appropriate regulations or directives to give effect to the principles set out in Articles 101 and 102 TFEU. Crucially, the scope of this competence is limited by the scope of the principles in Articles 101 and 102 TFEU. Any measures adopted by the Council under Article 103 must serve the implementation of Articles 101 and 102 and must not change or enlarge their scope.[193]
The aim of the NCT as stated in the IIA was to *address gaps* in the current EU competition rules. It referred to structural competition problems that cannot be tackled under Articles 101 and 102 TFEU. Thus, it appears the tool was not geared towards giving effect to the principles in Article 101 and 102, but rather towards new powers that go beyond the scope of Articles 101 and 102.[194] For example, allowing the commission to intervene in markets with structural competition problems where there has been no infringement of 101 and 102 would entail the creation of a power of enforcement beyond the scope of these articles. This was also the case with the EU merger regulations, which was why Article 352 TFEU was principally the legal basis for these regulations, alongside Article 103 TFEU.[195] This will be discussed in greater detail below.
The NCT as initially envisioned sought to create new enforcement powers which go beyond the scope of Articles 101 and 102 TFEU. Measures that can be adopted under Article 103 TFEU are limited by the content of these articles. For this reason, Article 103 TFEU by itself would not be an adequate legal basis for such a tool.

5.1.2. Article 114 TFEU

It is also debatable whether Article 114 TFEU in combination with Article 103 TFEU would be an adequate legal basis for a tool like the proposed NCT. Article 114 empowers legislation to achieve harmonisation of national laws where differing laws would act as obstacles to the establishment and functioning of the internal market.[196] It can be used to eliminate obstacles to the exercise of fundamental freedoms and to remove distortions of competition.[197] Article 114 has been the legal basis for directives in a wide range of areas such as consumer rights, financial markets and mortgage

[192] Commission Inception Impact Assessment, *supra* note 5.
[193] B. VESTERDORF, K. FOUNTOUKAKOS, 'A New Competition Tool into Old Bottles? Considerations on the Legal Design of the European Commission's Proposed NCT' (2020) *Journal of European Competition Law & Practice,* p.1-17, at 5.
[194] *Ibid.*
[195] Council Regulation (EEC) No 4064/89 of 21 December 1989 on the control of concentrations between undertakings, [1989] O.J. L395, Council Regulation (EC) No 139/2004 of 20 January 2004 on the control of concentrations between undertakings (the EC Merger Regulation), [2004] O.J. L24.
[196] B. VESTERDORF, K. FOUNTOUKAKOS, *supra* note 198, p.5.
[197] C. BARNARD, *The Substantive Law of the EU,* 4th ed., Oxford University Press: Oxford, 2013, p.639-640.

credit,[198] and has been useful in promoting the internal market. However, it does not confer upon the EU a general competence to regulate any aspects of the functioning of the internal market. There must be a genuine link between the adopted measure and the removal of obstacles in the internal market. It is possible to revert to Article 114 where the aim is to prevent future obstacles to trade as a result of diverging national laws, however such obstacles must be likely to emerge, and the measure must be designed to prevent them.[199] Furthermore, the mere existence of disparities between Member States' laws is not sufficient to justify recourse to Article 114. It must be shown that there is a clear risk of divergence between Member States which jeopardises the internal market.[200]

The aim of the NCT was not to eliminate obstacles to trade in the form of distortions to competition, but to intervene in markets with structural problems which fall outside the scope of competition law.[201] In the IIA the Commission states that:

the need for intervention at EU level stems from the pan-European business models of many market players as well as the cross-border nature of digital or digitally-enabled products and services and the increased consolidation of the internal market. However, even if in some cases relevant markets are defined as national under EU competition law, intervention at national level would not effectively address the cross-border dimension of competition related issues. This would likely lead to diverging rules.[202]

Firstly, it is questionable whether such regulatory divergence is likely. It is true that many Member States have adopted or are considering adopting legislative measures directed at core platform services provided by gatekeepers and their associated problems,[203] but whether potential divergences arising from measures of this kind would justify a new regulatory regime like a broad market investigation tool is questionable.[204] Divergences arising from these national legislative measures have been used to justify the use of Article 114 TFEU as a legal basis in the current draft DMA.[205] This is more understandable, as the draft DMA pertains to the same issues as these national legislative initiatives (core platform services provided by gatekeepers), so regulatory fragmentation constituting an obstacle to the internal market would appear more likely in this scenario. However, it is unclear how a market investigation tool could be considered as designed to prevent divergences in national laws concerning core platform services provided by gatekeepers.

This begs the question, what sort of regulatory divergences among national laws could one envisage, such that harmonisation by way of a market investigation tool would be justifiable under Article 114 TFEU? At present, only two EU Member States have a market investigation tool at their disposal.[206] However, if in the future other national competition authorities adopted a similar tool, perhaps due to the increased risk of tacit collusion caused by algorithms, we might then have a case of regulatory

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[198] Rafal Manko, 'EU competence in private law', European Parliamentary Research Service, January 2015, retrieved on 24 April 2021, https://www.europarl.europa.eu/RegData/etudes/IDAN/2015/545711/EPRS_IDA%282015%29545711_REV1_EN.pdf.

[199] B. VESTERDORF, K. FOUNTOUKAKOS, *supra* note 198, p.5.

[200] *Ibid.*

[201] Commission Inception Impact Assessment, *supra* note 5.

[202] *Ibid.*

[203] Commission Proposal for a Digital Markets Act, *supra* note 6, Explanatory Memorandum.

[204] 'International Bar Association Antitrust Committee, Submission to the European Commission regarding the consultation of a New Competition Tool,' 8 September 2020, retrieved 25 April 2021, https://www.ibanet.org/Document/Default.aspx?DocumentUid=2E8BEF81-F52F-4886-8DA7-A5A764BACA0A.

[205] Commission Proposal for a Digital Markets Act, *supra* note 6, Explanatory Memorandum.

[206] Margarethe Vestager Speech to the ASCOLA Annual Conference, *supra* note 1.

divergence among Member States. Such a situation might not be very internal market friendly. For example, it could be argued that being subject to market investigation tools in some Member States and not others would put undertakings in those Member States not subject to it at a competitive advantage. The operation of different types of tools with different standards of intervention in different Member States could have the same effect. Harmonisation in the form of an EU wide market investigation tool might be considered necessary to remove this distortion of competition.

A similar type of debate is ongoing regarding divergences in national laws on price parity clauses used by online platforms in the hotel booking sector.[207] National competition authorities have taken different approaches to this issue and the divergences have led to suggestions for harmonisation in this area to bring greater clarity.[208] It is this type of situation that could give rise to a need for harmonisation by way of an EU wide market investigation tool, where some Member States had a tool of this kind and others did not, or where different types of tools were operating in different Member States, creating regulatory divergence amounting to an obstacle to trade.

In conclusion, it is questionable whether the type of regulatory divergence envisaged by the Commission in the IIA is likely. Moreover, it is questionable whether such divergence would justify a market investigation tool, as it is unclear how such a tool could be regarded as being "designed to prevent" such divergences. Therefore, it is doubtful that Article 114 TFEU could, at the present time, be a sufficient legal basis for a market investigation tool as initially envisioned by the Commission. Perhaps in the future, if the Commission were to revisit the issue of a market investigation tool to tackle algorithmic tacit collusion, more Member States will have adopted such a tool given the risk of algorithmic tacit collusion as outlined in this article. This might create regulatory divergence constituting an obstacle to trade that would justify a harmonising market investigation tool at EU level with Article 114 TFEU as its legal basis.

5.1.3. Article 352 TFEU

The market investigation tool would seek to give new powers of intervention to the Commission that are not provided for by Articles 101 and 102 TFEU. In this respect, it is conceptually similar to the EU Merger Regulations[209], as the original merger regulation also provided the Commission with new powers of intervention.

The EU merger regulation applies to mergers that create a dominant position as well as those that enhance one.[210] However, as was held in *Continental Can,* [211] Article 102 TFEU only applies to existing dominant positions and not the creation of new dominant positions. Therefore, the power to control mergers that create a dominant position under the Merger regulation entailed the granting of a new power to the

[207] Giorgio Monti, Susanna Augenhofer, 'Consumer Choice and Fair Competition on the Digital Single Market in the Areas of Air Transportation and Accommodation' European Union, October 2018, retrieved on 25 April 2021, https://www.europarl.europa.eu/RegData/etudes/STUD/2018/626082/IPOL_STU(2018)626082_EN.pdf.

[208] Verity Egerton-Doyle, Dasha Konnova, 'Price parity clauses and digital platforms: the rocky path to much needed clarity' 17 March 2021, retrieved on 25 April 2021, https://www.linklaters.com/en/insights/blogs/linkingcompetition/2021/march/price-parity-clauses-and-digital-platforms-the-rocky-path-to-much-needed-clarity.

[209] Council Regulation (EEC) No 4064/89, Council Regulation (EC) No 139/2004, *supra* note 200.

[210] Council Regulation (EEC) No 4064/89, *supra* note 200, Recital 6.

[211] Case 6-72, *Continental Can Company Inc. v Commission of the European Communities,* [1973] ECR-1973 - 00215.

Commission. For this reason, the original Merger Regulation and its predecessor have as their principal legal basis Article 352 TFEU, alongside Article 103 TFEU.[212]
Article 352 TFEU states that 'If action by the Union should prove necessary, within the framework of the policies defined in the Treaties, to attain one of the objectives set out in the Treaties, and the Treaties have not provided the necessary powers, the Council, acting unanimously on a proposal from the Commission and after obtaining the consent of the European Parliament, shall adopt the appropriate measures.' It therefore allows the Commission to propose additional powers necessary for the attainment of objectives in the Treaty. The market investigation tool would involve giving the Commission additional enforcement powers to improve competition in the internal market. Therefore, Article 352 TFEU would appear to be the more natural legal basis for it.
The use of Article 352 TFEU as a legal basis has important consequences. The legislative procedure under Article 352 TFEU requires unanimity in the Council, meaning that all Member States would need to be in favour of the proposed legislation. This could prove difficult to attain with a market investigation tool that would entail strong new enforcement powers for the Commission and allow the imposition of potentially far-reaching remedies. The somewhat controversial reaction to the proposed NCT this time around provides a warning of this possibility.[213] Use of Article 352 TFEU also means a reduced role for the European Parliament in that only their consent is required, and the attention of national parliaments must be drawn to proposals based on it.[214] Therefore, there are more onerous requirements when it comes to passing legislation under 352 TFEU than there would be under Article 114 TFEU. Nevertheless, this would appear to be the most appropriate legal basis for a market investigation tool like that initially envisioned by the Commission.

5.2. Proportionality

Proportionality is one of the general principles of EU law which governs the exercise of competences.[215] It is enshrined in Article 5 TEU, which states that under the principle of proportionality, the content and form of union action shall not exceed what is necessary to achieve the objectives of the treaties. This means that where the EU acts, that action must be suitable to achieve the desired objective and that the action should not go beyond what is necessary in order to achieve that objective. This includes a requirement that where there are differing ways to achieve an objective, the least onerous should be taken.[216] There will normally be three stages in a proportionality inquiry:

(i) Whether the measure was suitable to achieve the desired end.
(ii) Whether it was necessary to achieve the desired end.
(iii) Whether the measure imposed a burden on the individual that was excessive in relation to the objective sought to be achieved (proportionality *stricto sensu).*[217]

[212] Council Regulation (EEC) No 4064/89, Council Regulation (EC) No 139/2004, *supra* note 200.
[213] B. VESTERDORF, K. FOUNTOUKAKOS, *supra* note 198, p.1.
[214] Article 352(2) TFEU.
[215] P. CRAIG, G. DE BÚRCA, *EU Law Text, Cases and Materials,* 5th ed., Oxford University Press: Oxford, 2011, p.526.
[216] *Review of the Balance of Competences between the United Kingdom and the European Union,* HM Government, London, December 2014, p.34.
[217] P. CRAIG, G. DE BÚRCA, *supra* note 220, p.526.

There is doubt as to whether stage three is part of the ECJ's inquiry as it sometimes only addresses the first two questions. [218]

Proportionality is applied in many areas to protect different interests, with slightly different tests applied to different contexts.[219] It can be used to challenge the actions of EU institutions and EU legislation.[220] However, the courts can be slow to interfere with the decisions of the legislature considering the separation of powers. The Court in *Jippes*[221] took the view that, bearing in mind the wide discretionary power of the legislature in matters concerning the common agricultural policy, the criterion to be applied was not whether the measure adopted by the legislature was the only one or the best one possible, but whether it was manifestly inappropriate. This has come to be the general approach of the court when assessing the proportionality of EU legislation.[222]

The Court has on occasion struck down EU measures for being disproportionate. In *ABNA Ltd,*[223] it was held that a Directive which required manufacturers of animal feed to indicate, at a customer's request, the exact composition of the feed, was disproportionate, as it was not necessary to protect health and went beyond what was necessary to protect health. The Court found that this obligation needlessly infringed the economic interests of the manufacturers.[224]

The Court will usually look at the underlying need for the legislation and what issue it is trying to address.[225] It will consider whether there are other ways to address the issue which interfere less with rights. This might include a sort of cost-benefit analysis, examining what costs it imposes in relation to the benefits, which is usually very fact-specific.[226] Taking into account the deference afforded to the legislature with the "manifestly inappropriate" test, there is a fairly high bar to overcome before annulment of legislation.[227]

Concerns about the proportionality of the NCT were raised during the public consultations. The ETNO-GSMA position paper expresses that in order to comply with proportionality, the NCT would have had to only respond to the specific need to achieve the objectives of the treaties and could not have been addressed through existing or less restrictive means.[228] They raised doubts as to the necessity of interfering in oligopolistic markets, taking the view that Articles 101 and 102 TFEU are sufficiently effective to address them. They felt there was not sufficient justification for any further intervention powers.[229]

It is true that the Commission enjoys extensive competition powers under Articles 101 and 102 TFEU. Additionally, the EU Merger Control regime can be effective in preventing tacit collusion in oligopolies.[230] However, there is a lack of enforcement powers when it comes to intervening to address structural competition problems in

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[218] *Ibid.*
[219] W. SAUTER, 'Proportionality in EU Law: A Balancing Act', (2013) 15 *Cambridge Yearbook of European Legal Studies,* p.439-466, at 440.
[220] Joined cases C-453/03, C-11/04, C-12/04 and C-194/04 *ABNA Ltd et al v Secretary of State for Health et a*l [2005] ECR I-10423.
[221] Case C-189/01 *Jippes* [2001] ECR-I5689, para 82.
[222] T. TRIDIMAS, *The General Principles of EU Law,* 2nd ed., Oxford: Oxford University Press, 2006, p.138
[223] *ABNA, supra* note 216, paras 80-83.
[224] *Ibid.*
[225] HM Government, *supra* note 221, p.36.
[226] *Ibid.*
[227] *Ibid.*
[228] 'ETNO-GSMA Position Paper on a New Competition Tool,' September 2020, retrieved on 20 April 2021, https://etno.eu/component/attachments/attachments.html?id=7802&task=download.
[229] *Ibid.*
[230] R. WHISH, D. BAILEY, *supra* note 8, p.864-6.

markets where no conduct has taken place that has infringed the existing competition rules.
It is interesting that disproportionate interference with private economic interests has been sufficient in the past to strike down legislation, as observed in *ABNA.* In this manner, a concern on the part of businesses that the market investigation tool would disproportionately interfere with their economic interests would be legitimate.
It is perhaps the powerful remedies that the market investigation tool would be endowed with which would cause the greatest proportionality concern. A structural remedy like a divestiture could represent a huge cost to a business and interfere substantially with rights.[231] It could be argued that such a remedy would disproportionately eliminate competition concerns, especially considering the conduct would not entail a breach of competition rules. As previously observed, the remedy regime would have to be mitigated by strict safeguards. There should be a proportionality check in the remedy regime, providing that remedies should only be imposed to the extent that they will be demonstrably effective in addressing the perceived harm to competition and proportionate to the harm that they seek to address.[232] Vesterdorf and Fountoukakos note that the types of issues that it was envisaged the NCT would address appear better suited to behavioural rather than structural remedies.[233] Indeed, earlier in this article behavioural remedies were identified as most effective in tackling algorithmic tacit collusion specifically. Perhaps if algorithmic tacit collusion were the focus of a market investigation tool in the future and there were proportionality concerns over the ability to impose structural remedies, these could be omitted from the new tool so that behavioural remedies would be the only remedial options.
The presence of strict safeguards when it came to the deployment of the tool would also be necessary. These would include establishing a clear legal test which the Commission must satisfy before making a finding under the NCT, establishing a standard of proof for the problem the Commission has identified, and an evidentiary standard to show the Commission had discharged its standard of proof.[234]
The presence of appropriate safeguards regarding the deployment of a market investigation tool and the remedial regime under it would be crucial for it to be regarded as proportionate. I do not see why adequate safeguards as described above could not be assured in a prospective market investigation tool in the future.
In summary, there exists a clear enforcement gap in the form of structural competition problems that fall outside the scope of the existing competition rules. The market investigation tool would be targeted at these problems. Market investigation tools are used to tackle non-algorithmic tacit collusion in other jurisdictions, so there is clear precedent that the Commission could rely on to show that the tool would be targeted at fixing a specific competition problem and would be successful in doing so. Moreover, in the future, there may be more concrete evidence of algorithmic tacit collusion in markets. The Commission could also demonstrate the usefulness of a market investigation tool in tackling this problem specifically, as I have done in this article. Considering the high standard of "manifest disregard" that applies to the assessment of the proportionality of union legislation, it is my view that these justifications for a market investigation tool, alongside sufficient safeguards regarding

[231] Schweitzer, *supra* note 164, p.36.
[232] B. VESTERDORF, K. FOUNTOUKAKOS, *supra* note 198, p.13.
[233] *Ibid.*
[234] B. VESTERDORF, K. FOUNTOUKAKOS, *supra* note 198, p.10.

its deployment and under its remedial regime, would be sufficient to demonstrate that such a tool would be proportionate.

Conclusion

Algorithmic tacit collusion is no longer a science fiction. Empirical evidence now shows that the adoption of pricing algorithms facilitates tacit collusion. This evidence pertains either to the hub and spoke or predictable agent scenario. It is therefore these two scenarios that competition authorities should be most preoccupied with. The digital eye scenario has been shown to be capable of occurring in experimental settings, with the Calvano study serving as proof in principle that autonomous self-learning algorithms can independently learn to collude “in the wild”.

However, overall, the evidence of algorithmic tacit collusion is limited. Academics should continue to conduct studies and experiments to learn more about how algorithms operate and affect competition. The Commission should keep a close eye on this issue and use all the investigative powers at its disposal to gather more information about algorithmic tacit collusion.

A market investigation tool is used in many different jurisdictions to tackle structural competition problems and to combat tacit collusion, and it has shown its effectiveness in this regard. Such a tool would be useful in combatting algorithmic tacit collusion. Firstly, it would allow the Commission to carry out thorough investigations of markets to observe how algorithms affect competition on the market. Secondly and crucially, if evidence of algorithmic tacit collusion is found, the Commission could intervene and impose remedies against it. Effective behavioural remedies include reducing the frequency with which companies may adjust prices, limiting price disclosures, and imposing design and operation changes to algorithms so they do not collude.

The proposed NCT was a positive step on the part of the Commission towards addressing algorithmic tacit collusion. Ultimately, its undoing was the fact that stakeholders did not perceive a need for such a wide-ranging tool, nor did they consider algorithmic collusion to be a problem that could not be tackled using the existing toolbox. Furthermore, the proposed legal basis for the NCT was problematic. The NCT as envisioned constituted the granting of new powers to the Commission which precludes the use of 103 TFEU on its own as a legal basis and, as demonstrated above, could not have been considered a harmonising measure for the purpose of Article 114 TFEU. In the future, more jurisdictions may have adopted their own market investigation tools which could cause regulatory divergence in the single market. Such a scenario might justify recourse to Article 114 TFEU. Otherwise, Article 352 TFEU would appear to be the more appropriate legal basis.

It will be interesting to observe this area in the coming years. Pricing algorithms are becoming more widespread and algorithmic tacit collusion is already on the radar of competition authorities. It is my prediction that more evidence of it will soon emerge, which may lead the Commission to once again consider the adoption of a market investigation tool to combat it. As noted by Commissioner Vestager, competition policy must adapt to the challenges brought by new technology.

For now, the market investigation tool has been shelved, but technology moves quickly. This may not be the last we hear of it. And perhaps when the time comes to remove it from its shelf for reconsideration, it will not have gathered much dust.

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