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Federal Trade Commission

**Should We Fear The Things That Go Beep In the Night?
Some Initial Thoughts on the Intersection
of Antitrust Law and Algorithmic Pricing**

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Thank you all for having me. This evening I am going to talk about a topic that has been generating a lot of interest in both the press and the academy recently: the use of computer algorithms to automate decision-making by market participants.

one of those variables. Certain algorithms can gain accuracy over time, by identifying patterns in data and adjusting to the patterns they identify.

Perhaps unsurprisingly, once people realized computers could be programmed to make decisions more quickly and accurately than humans in some narrow, clearly defined areas, they tried to gain a trading advantage using these new tools. Algorithmic trading is a ubiquitous phenomenon across the financial markets today.

Eventually, people figured out that the useful applications for this kind of high-speed, rules-based approach to financial decision-making were not limited to trading stocks or bonds. As algorithms spread out from the financial markets and started to be used in the on-line pricing of consumer goods, voices have been raised in alarm.² The inner workings of these tools are poorly understood by virtually everyone outside the narrow circle of technical experts that directly work in the field. But they raise a number of questions. Are there opportunities for mischief in the black box nature of all this? Will the use of pricing algorithms allow firms to collude or increase prices in ways that will ultimately go undetected by the enforcement agencies? Does antitrust doctrine need to change in important ways to reflect the greater use of automated decision-making across markets?

I'd like to suggest tonight that although antitrust enforcers should always remain vigilant for new forms of anticompetitive behavior, some of the concerns about algorithms are a bit alarmist. From an antitrust perspective, the expanding use of algorithms raises familiar issues that are well within the existing canon. An algorithm is a tool, and like any other tool, it can be

² See, ARIEL EZRACHI AND MAURICE E. STUCKE, VIRTUAL COMPETITION, THE PROMISE AND PERILS OF THE ALGORITHM-DRIVEN ECONOMY, (Harvard Univ. Press 2016) (containing an extended and detailed analysis of the potential pitfalls of algorithmic pricing).

put to either useful purposes or

All of that is about to change. At 6:00AM one bright clear Monday morning, the owner of the first gas station gets out his ladder and leans it against the big price sign out front. He then climbs up the ladder and changes the price, making it five cents a gallon more expensive.

Then he takes his ladder down, walks over to a lawn chair in the shade and sits down to have a cup of coffee. At 10:00AM, he gets the ladder back out and lowers his price back down five cents so his price is now the same as everybody else's price. He repeats that same pattern of behavior every Monday morning.

He never directly talks to his competitors about the prices he is charging or why he is doing what he did. Has he violated the antitrust laws just by changing his price for four hours? If that is all he has done, the answer is no. Generally, firms are free to set whatever prices they choose, as long as they act independently.

Nor would it be unlawful for one of the other gas stations to decide, on his own, to follow the lead of our analog-era friend with the ladder and start raising his own prices on Monday mornings. Even if all the stations in the town ultimately decide to follow the lead of the first station and raise prices five cents, then keep those high prices in place, the antitrust laws do not condemn this behavior.

So why don't we enforcers take action in this situation to prevent conscious parallelism? The simple reason is that there is no sensible remedy here.³ In a free market, individual actors are free to set their prices on the basis of all the information legally available to them. It is

³ See, *Brooke Group Ltd. v. Brown & Williamson Tobacco Corp.*, 509 U.S. 209, 227 (1993) (describing conscious parallelism as "not in itself unlawful"); see also *Reserve Supply Corp. v. Owens Corning Fiberglas Corp.*, 971 F.2d 37, 50 (7th Cir. 1992) (discussing why interdependent pricing is not unlawful: "This is not because such pricing is desirable (it is not), but because it is close to impossible to devise a judicially enforceable remedy for 'interdependent' pricing. How does one order a firm to set its prices *without regard* to the likely reactions of its competitors?").

axiomatic that we cannot tell firms to ignore the public behavior of their rivals when they set

firms could somehow secretly discount and steal market share from their rivals, they have a significant incentive to do that and so on.

What antitrust law does address in these situations is the glue that can hold together a group of competitors who might otherwise be unable to tacitly coordinate prices by simply watching each other's behavior. That glue is an express agreement among competitors, and it can overcome problems with insufficient price transparency, product differentiation, too many competitors and the like. A cartel is nothing more than an agreement among a group of competitors to fix prices or output so that prices can be maintained above competitive levels.

So while our friend with the ladder may eventually, informally lead everyone's prices higher, things look a lot different from a legal perspective if he walks over to one of his competitors and starts talking to him about prices. Suddenly we now have conduct that has nothing to do with independently setting prices and reacting to market conditions. The policy considerations that tolerate unilateral but interdependent pricing no longer apply. Once competitors reach an agreement setting price or output, they are engaged in behavior with no social utility and an enforcement response by the government is warranted.

So there is a critical legal difference

in law school might even remember some variant of the gas station hypothetical, as it has been used for many years to explain the mechanics of interdependent pricing.

What I'd like to suggest to you this evening is that this same analytical framework is sufficiently flexible and robust that it can already accommodate several of the current concerns applicable to the widespread use of algorithms.

Single Firm Use of Algorithms

I will start with the easiest question, the use of a complex algorithm by a single firm to observe and respond to various market conditions and set prices nearly instantaneously in response to changes in the market.

Go back to my gas station example. If the market participants cannot see their competitors' posted prices easily with their naked eyes, they might decide to buy a pair of binoculars to read their competitors' signs better from the comfort of their offices. The binoculars make it easier for the market participants to understand market conditions more quickly and respond accordingly. It is certainly true that the binoculars increase transparency in the market and thereby make it easier for informal, tacit coordination to take place. But we don't use the antitrust laws to police firms' abilities to understand the markets they operate in or to optimize prices.

We may recognize that the binoculars make it easier to understand the behavior of competitors and that fact, in turn, becomes part of the calculus in evaluating future mergers in this space. But we don't ban the use of binoculars just because they can be used to assist in conscious parallelism. Unilateral efforts to understand market conditions better and respond to

(2) Algorithms As Hub of Conspiracy

What if algorithms are not used in such a clearly illegal way, but instead effectively become a clearing house for confidential pricing information? Imagine a group of competitors sub-contracting their pricing decisions to a common, outside agent that provides algorithmic pricing services. Each firm communicates its pricing strategy to the vendor, and the vendor then programs its algorithm to reflect the firm's pricing strategy. But because the same outside

Conclusions

It is certainly true that as markets move on-line, they can become much more transparent. As I have explained here tonight, transparency can be either a good thing or a bad thing for consumers, depending on the broader market dynamics. But there is nothing inherently suspect about using computer algorithms to look carefully at the world around you before participating in markets.

So, from my perspective, if conduct was unlawful before, using an algorithm to effectuate it will not magically transform it into lawful behavior. Likewise, using algorithms in ways that do not offend traditional antitrust norms is unlikely to create novel liability scenarios.

The enforcement agencies should remain vigilant here, in the same way they need to remain vigilant about all new market dynamics. But I'm not yet afraid of the things that go beep in the night. Nor do I think that the Federal Trade Commission is planning to take away your ability to use mathematics and computers to fully engage with markets as effectively as you can.

Thanks very much for having me.