"Checkers strategy in a game of chess: Implications of multi-product firms using single product pricing algorithms on competition"

Abstract:

We revisit the nascent literature on algorithmic collusion (Calvano et al, Hansen et al) which considers settings where single-product firms compete by setting prices via algorithm, and establishes that supra-competitive prices may arise in such settings. Our key point of departure is that we consider multi-product firms. We show evidence that despite selling multiple products, in practice, firms often price each item via independent algorithms to mitigate the curse of dimensionality. In other words the algorithms in use optimize each product individually rather than jointly optimizing over the entire product assortment. We show that in such settings, the risk of supra-competitive outcomes is reduced and can even result in sub-competitive prices. Conversely, we show that if firms were able to solve the dimensionality and use algorithms that priced jointly, this may increase the mechanisms by which collusive prices are reached, including multi-market contact.