

## The Welfare Effects of Ticket Digitization

Phillip Leslie

The event ticketing industry is beginning to adopt fully digital ticketing technologies. While it has been common to receive an electronic ticket (a pdf file) for many years now, in that case a paper ticket would still be printed and utilized to enter the event. In contrast, the new fully digital ticketing technologies involve no paper at any point in the process: consumers enter an event using their smartphones or the credit card used to purchase the ticket. In practice, this new technology is referred to as “paperless ticketing”. At first glance, the adoption of paperless ticketing technology seems like an unsurprising and uncontroversial development. However, the technology will be highly disruptive to some incumbents, and it has already provoked a regulatory response ostensibly aimed at protecting consumers against certain uses of the new technology.<sup>1</sup> As in other industries, it would appear that digitization is good for some firms and bad for others, with potentially ambiguous consequences for consumers.

In this research, we propose to study how the introduction of paperless ticketing may impact firms and consumers. Although the ticketing industry is non-trivial, our goal is to increase our understanding of how digitization affects value chains, including changes in the vertical structure, industry and firm profitability, and consumer welfare. In this particular instance, we suspect one of the major consequences of digitization is the impact on pricing—paperless tickets may significantly enhance the ability of artists and teams to capture more value via new modes of pricing.

Central to the research is the potential for paperless tickets to prevent or control ticket resale. Ticket resale (or scalping) has been widely deregulated in the US over the last 10 years, and has become a very important aspect of ticket markets.<sup>2</sup> Currently, StubHub (owned by eBay) is the dominant online ticket resale site, and they have been enormously successful at stimulating ticket resale for both concerts and sports (particularly baseball). StubHub receives a 25% commission for every ticket resold on their site.

However, paperless ticketing may dramatically change the economics of the economics of ticket reselling, and ticket markets more generally. Paperless technology provides more control over their tickets than ever before for artists and teams. In particular, with paperless tickets it is possible to either shut down resale altogether by making the tickets non-transferable, or to constrain which web sites can be used by ticket owners to resell their tickets, or at what prices the tickets can be resold. For example, it is possible to allow buyers to resell their tickets, but only on a designated web site where the artist or team captures a resale commission for themselves. Hence, the issue that divides the industry: some firms want to utilize paperless tickets to capture value from the resale market, while other firms (especially StubHub) oppose restrictive paperless tickets and seek regulatory protection.

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<sup>1</sup>New York state has passed a law requiring that whenever paperless tickets are issued, consumers are also provided the option of transferable paper tickets. Other states are considering similar regulation.

<sup>2</sup>In Leslie and Sorensen (2011) we study the welfare effects of ticket resale for rock concerts. See *vitae* for full citation.

By allowing the primary market seller to control resale, digitization provides additional pricing levers. Artists and teams can jointly optimize primary market prices (including prices that vary by seat quality and season ticket prices, in the case of sports teams) and whether resale is allowed; and if so, whether and how resale prices will be constrained, as well as any commission that is charged on resale transactions. Moreover, part of the attraction to incorporating the resale elements in the pricing problem is that event demand tends to be uncertain, and resale pricing is market driven (in contrast to primary market prices which are set by the artist or team).

We aim to develop a model of ticket markets that incorporates optimal primary market pricing, resale, and paperless tickets that allow the firm to control resale transactions. In addition to including paperless tickets, an important innovation in the research is to allow for a season of events—to build a model that can be applied to sports ticket pricing. This is important because the issue of whether resale should be constrained or eliminated is of particular interest to sports teams, where reselling by season ticket holders (the largest sales category of primary market sales for many sports teams) is believed to be cannibalizing individual ticket sales and undermining the bundling model of season tickets.

However, expanding the model to include a season of games raises difficult challenges for the research, as we must allow for multiple periods of resale and bundle pricing options in the primary market. We will utilize computational methods to solve the model and rely on data to parameterize the model, either via estimation or calibration depending on the computational burden. A detailed road-map outlining the computational model and algorithm for solving the optimal pricing problem has been completed and is available upon request. We have also obtained detailed sales data from the Los Angeles Dodgers, and StubHub has agreed to provide us with their resale data.

One of our goals with this research is to analyze the impact of digital ticketing on consumers. As mentioned above, legislators have already been prompted to impose limits on how the new technology can be utilized, based on the assertion that such constraints are needed to protect consumers. This is somewhat typical of other industries where digitization is often accompanied by lobbying for regulatory protection, although it is interesting that in this instance the justification is purported to be for consumers' best interests, rather than mitigation of piracy or some other threat to incumbent firm's profitability. The issue in this case is indeed complex—resale affects demand and hence primary market prices, but the solution to the optimal pricing problem will be very different depending on whether the primary market seller controls resale. Our analysis will help to clarify these issues.

This research is being undertaken with Ben Shiller who has just graduated from Wharton and is currently a post-doctoral fellow for the Economics of Digitization and Copyright Initiative at the NBER. Ben has done prior research on resale of digital video games. I have done prior research on ticket pricing, bundling, and the welfare effects of ticket resale. If we are successful with this grant application, I plan to utilize funding for computing and travel costs.